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UTILIZATION OF PHYSICALLY HANDICAPPED
OFFICERS IN NAVY BILLETS

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UTILIZATION OF PHYSICALLY HANDICAPPED OFFICERS IN NAVY BILLETS

ABSTRACT OF
A THESIS PRESENTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE MASTER OF SCIENCE

BY

FRED IRMER MATHER, B. A.

THE OHIO STATE UNIVERSITY

1949

UTILIZATION OF PHYSICALLY HANDICAPPED OFFICERS IN NAVY BILLETS

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(Approved by Harvey Walker)

The need for retaining and using in the Navy, officers who have become physically handicapped is apparent from: 1) the mounting pension costs due to a contrary policy, 2) the waste of experienced and trained though partially disabled officer personnel, and 3) the decline in morale among nonhandicapped officers working under a policy under which their careers may end abruptly and their compensation may be halved if they become physically impaired.

This thesis suggests 1) that the physical requirements of billets and the physical capacities of disabled officers be determined, evaluated, and profiled, and 2) that the abilities of impaired officers be matched to the physical demands of suitable billets. The underlying hypotheses are that few jobs demand all the physical capacities of naval officers and that even disabled officers often have more ability than disability.

The employment of physically handicapped persons in industry indicates no significant difference between the able and the disabled from the standpoint of efficiency on

the job, absenteeism, and injury frequency. The success with which the Canadian, British, and U. S. Army physical classification and profiling systems match disabled personnel to suitable duties augurs well for the probable success of a comparable system in the Navy.

Selective placement, through physical classification of officers who have become disabled in the service, is particularly easy, since their previous aptitude, training, skill, and interests already are known.

The technique of matching disabled officers to Navy jobs where their disabilities are inconsequential is proposed in this thesis. Inasmuch as the Navy is nearing the completion of the task of analyzing, appraising, and classifying officer billets, such a technique can be employed in the near future.

UTILIZATION OF PHYSICALLY HANDICAPPED OFFICERS IN NAVY BILLETS

A Thesis

Presented in Partial Fulfillment of the Requirements

for the Degree Master of Science

By

PHILIP IRWIN WAGNER, B. A.

The Ohio State University

1949

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CHAPTER I

INTRODUCTION

UTILIZATION OF PHYSICALLY HANDICAPPED OFFICERS IN NAVY BILLETS

INTRODUCTION

Statement of the Problem

The failure in the past to provide for effective in-service use of physically handicapped Navy officers has resulted in waste of experienced and trained manpower, mounting disability pensions, and poor morale. All of the Armed Services, recognizing these problems, are developing methods for solving them. At present, one of the most important and also one of the newest developments is the system of classifying, profiling and matching the physical characteristics of service billets and personnel. This development is considered herewith. In brief, this thesis seeks first, to show the need for utilizing physically impaired officers in Navy billets and second, to present the method to be employed.

The Behavior Equation

Achievement in any human endeavor largely depends upon the definition, measurement, control, and utilization of the following three variables that make up the equation of successful human behavior, namely: capacity, interest,

opportunity. Capacity may be further categorized as to aptitude (innate general intelligence), proficiency (acquired skills), and physical ability. All naval billets demand of the naval officers certain minimum capacities for the successful execution of the job. The most satisfactory ends will be gained through the proper relationship of the above three variables. The naval officer needs opportunity to develop those capacities required by the billet and must have interest in the billet to the end that those capacities will operate effectually.[1]

Much has been done in the study of aptitudes, proficiencies, interests, and opportunities in the naval service, both as to the job requirements and the persons filling those jobs. With the exception of the fields of aviation and submarine medicine, very little has been done concerning the analysis of either the physical demands of billets or the physical classification of naval officers, unless the catch-all criteria of near-physical perfection or "fit for sea duty" is considered. Since physical perfection was discovered to be almost non-existent during the recent war mobilization the determination of minimum physical standards for the various types of duties is a more practical alternative than a high rate of rejection

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[1] Harold E. Burtt, Principles of Employment Psychology, p. 9.

of personnel in a dwindling manpower pool.

Functional Approach

Functional efficiency, in the physical or social sciences is dependent upon two things: first, how well machines or human beings are designed for particular missions; second, how effectively they are utilized to perform these missions. The ultimate goal is the utilization of military personnel with the maximum of economy and efficiency. The most certain method of achieving this goal is to engage personnel:

1. At the approximate level of their physical, intellectual, and emotional capacities, not too far above or below.
2. In billets commensurate with their interests, experience, knowledge and skills.
3. With opportunity to promote and exercise potential abilities to the limit of their capacities.[2]

This functional method of personnel employment can be effective in the utilization of physically handicapped officers in Navy billets since only their capacities would be considered--not their incapacities. A few basic principles concerning functionalism may be in order at this point. Captain C. M. Mooney of the Directorate of Organiz-

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[2] C. M. Mooney, "PULHEMS", Canadian Army Journal, Number 1 (April, 1947), pp. 16-17.

ation, Army Headquarters, Ottawa, Canada, one of the pioneers of functional classification of military personnel, sums up these tenets of function as follows:

> "A thing is functional when it fulfils a particular purpose. The more simply it fulfils that purpose the more purely functional it is. Directly or indirectly all things are functional. The simplicity or complexity of the purposes which they are to fulfill dictates the simplicity or complexity of their structure. Nothing is more simply functional than military weapons, for instance. They achieve the maximum of deadliness with the minimum of parts, weight and design. Nothing is more complexly functional than human beings and societies of human beings."[3]

Job Analysis

The functional analysis of human physical capacities calls for an objective breakdown and classification of physical faculties. The functional analysis of the physical requirements of naval billets calls for job analysis. The former type of analysis is the concern of the medical specialist while the latter kind of analysis is the task of the personnel technician, specifically the job analyst. The matching of the individual's physical capacities to the physical demands of the job is the joint product of this medical and personnel specialist team. In this functional approach the vital items of the job analysis are (1) the physical requirements of the job, (2) worker characteristics, and (3) working conditions.

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[3] Ibid., p. 16.

The physical demands of the job must be ascertained before any accurate decision can be reached as to whether or not a disabled officer or one possessing physical limitations can discharge the duties of the billet. In addition, occupational data concerning physical requirements are essential "as a guide in re-engineering jobs so that modifications can be made in duties to permit the employment of a greater number of handicapped workers."[4] Worker characteristics are those basic abilities (physical, mental and personal traits) required of the officer to carry out the tasks of the job and as Carroll L. Shartle emphasizes: "....are the characteristics required to perform the work ....not the characteristics of the present worker on the job."[5] Working conditions are also considered as part of the job and include the hazards inherent in the physical activities and working conditions of the billet as well as surrounding environmental factors and changes therein.[6]

The writer does not mean to infer that physical requirements come first nor does he wish to overemphasize the importance of physical demands of billets at the expense of

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[4] Carroll L. Shartle, Occupational Information, p. 21.

[5] Ibid., p. 21.

[6] Training and Reference Manual for Job Analysis, U. S. Employment Service, Department of Labor, June, 1944, pp. 38-44.

aptitude, proficiency, and interest. His contention is merely that anyone possessing the aptitude, skill, interest and experience necessary for a billet should not be misused or rejected because of the lack of certain physical abilities (viz. disabilities) if the job does not call for those abilities or if the disabilities have no relationship to the billet or are not detrimental to the successful performance of the duties of the billet as revealed by an objective job analysis.

Past Practices

Historically no particular attempt has been made to analyze naval officer jobs because of the general impression that most billets were already adequately understood. Moreover, naval tradition imposed the theory that every officer must be potentially competent to execute any kind of duty or mission. This jack-of-all-trades concept of a naval officer, although possibly valid in sailing ship days, has been exploded by the development of the highly technical and unfamiliar tasks of modern naval warfare. With the scraping of the bottom of the manpower barrel in the days of World War II, it became increasingly difficulty to find physically perfect officer personnel, technically experienced or even qualified for training to fill the increasing number of specialized billets.[7]

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[7] A Statement of Its Mission, Billet and Qualifications Research Division, Bureau of Naval Personnel, Navy Dept., February, 1947, p. 5.

pensions are out of line with the most liberal industrial policies and the morale of the disabled as well as the physically able officer suffers when he is subject to a possible sudden curtailment in his career and a fifty percent reduction in income on becoming disabled. A technique that classifies, profiles and matches the physical demands of billets and the physical abilities of officers will go a long way toward eliminating or reducing these problems. It is the purpose of this thesis to present the job analysis and physical demands approach as a technique for the utilization of physically handicapped officers.

These problems overlap and, in many cases, have their genesis in the misconceptions of early tradition and social attitudes. The handicapped officer represents an issue that the Navy must face if charity (viz. pensions) is not to be the answer.[10] Considerable research in the employment of impaired personnel has been conducted in industry and government services. The issues are being squarely met and results are gratifying and illuminating, if not startling. In all services of the armed forces experimentation is being carried on in this field. However, it is to industry and the Federal service that we

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[10] Michael J. Jucius, Personnel Management, p. 638.

must turn for the greatest fund of data and results, of which part can be borrowed and applied to the military situation.

Results in Industry

A survey was made by the Industrial Hazards Division, U. S. Bureau of Labor Statistics covering 1.3 million employees, 63,382 of whom were physically impaired.[11] By physical impairment was meant disabilities serious enough to restrict the working capacities of workers if not appropriately employed. The results of this survey indicated that there was very little difference in the work performance efficiency of the impaired as compared with the unimpaired. Moreover, data on absenteeism, injury frequency, and employee turn-over showed a better record for the physically handicapped in those respects. The findings in percentages is summarized as follows:[12]

Performance Factor	Per Cent Impaired Workers Reported		
	Better than Unimpaired	As good as Unimpaired	Poorer than Unimpaired
Efficiency on the job	7.8	87.0	5.0
Absenteeism	49.0	43.8	7.2
Injury frequency	51.1	37.7	11.2
Labor turn-over	58.5	30.8	10.7

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[11] Carroll L. Shartle, op. cit., p. 289.

[12] Ibid., p. 290.

Attention is invited to the tables in Appendix A which summarize the statistical findings resulting from a comprehensive study made by the Bureau of Labor Statistics, U. S. Department of Labor in 1946 and 1947.[13]

Objectives and Goal

Throughout the past thirty years physical standards have undergone two extremes. During World War I the lack of scientific physical standards permitted the using of many individuals who later proved to be unjustifiable industrial and military risks. In the light of present day criteria, comprehensive physical examination and classification was still in its infancy. Since World War I, the pendulum has swung to the opposite extreme.[14] Physical requirements have evolved which have not always been justifiable from the point of view of efficiency, economy, and the changing design of warfare. The objective is to balance these two extremes in standards through a functional approach. As indicated above, much can be gleaned from the data of studies in industry. By comparing the physical requirements of industrial or civilian jobs

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[13] The Performance of Physically Impaired Workers in Manufacturing Industries, U. S. Bureau of Labor Statistics, Bulletin No. 923, 1947.

[14] Operations Manual for Placement of the Physically Handicapped, U. S. Civil Service Commission, 2nd. Edition, July, 1943, p. v.

with analogous naval billets, differences in physical demands, if any, can be brought to light. As to the similarities, the Navy can adapt some of the practices of using physically disabled personnel that industry has successfully employed.

A system is needed, first, to assess accurately the physical abilities of every officer (i.e. a medical appraisal and classification), second, to analyze and factor out the physical demands of every naval officer billet (i.e. job analysis), and third, to match as efficiently as possible the bodily capacities of naval officers to the physical requirements of the billet (i.e. selective placement of personnel). As to the first requirement, the writer suggests the profiling method which is described in Chapter IV "Method". The "physical demands" approach of job analysis, also discussed in Chapter IV, is offered as the technique for the second requisite. As to the third need, the matching process will be discussed and an instrument will be proposed for administering this procedure.

The ultimate goal "...is to insure that the right person is in the right place at the right time."[15] The way to that goal is to define all military jobs and to determine the minimum qualifications demanded of the

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[15] A Statement of Its Mission, Research Division, Bureau of Naval Personnel, op. cit., p. 1.

personnel who fill them. The utilization of physically handicapped officers is based on the same fundamental principles as those involved in the effective employment of nonhandicapped officers, namely the right person in the right place at the right time. It is a matter of matching naval officers to naval billets for which they are best suited by aptitude, training, skill, experience, and physical abilities.

CHAPTER II

NEED FOR ANALYSES

NEED FOR ANALYSIS

One of the objectives of modern personnel administration as applied to naval officers is to secure the most capable officer material that can be obtained for the compensation that the Navy has to offer and to keep them in the service as long as they can be utilized effectively.[1] Failure to meet or approach this objective in the past has tended to result in less than the most efficient management of officer personnel in getting the U. S. Navy's "job of work" done.[2] It also leads to dissipation of manpower in wartime, mounting pensions (often unrealistic and bordering on a "racket"), and low morale of the physically handicapped whose capabilities are not employed.

Administrative Problems

United States Navy Regulations describes naval personnel administration as the responsibility "for the procurement, and distribution of all personnel of the Navy, including the Naval Reserve Officers' Training Corps."[3] To perform this

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1 Harvey Walker, Public Administration in the United States, p. 140.

2 Manual of Instruction for Naval Occupational Analysis, NAVPERS 15,803, Bureau of Naval Personnel, 1949, p. 2.

3 U. S. Navy Regulations 1948, Chapter 4, Section 5, Article 0440.

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task of personnel administration properly, a scientific method should be followed whereby job requirements are determined and brought into relation to the capacities of personnel. Job analysis technique uncovers important job elements for use in evaluating the ability of any person to satisfy the demands of the job. The physical demands section of the job analysis discloses the physical requirements of the job. The physical qualification examination records disclose the physical capacities of individuals. Proper placement and utilization of personnel results from the matching of capacities to requirements.

In administering a scheme for employing disabled officers, the problem revolves around (1) definition of physical disability, (2) teamwork between the naval occupational analyst and the naval medical specialist, and (3) placement or utilization by personnel men.

There is little common agreement as to what is a physical handicap. Standards have varied widely in the armed services as well as in industry. One definition of handicapped persons is: "All those who for physical, mental, emotional, or social reasons are not readily accepted into normal occupational employment,"[4] while another is: "One who requires selective job placement because of a physical or mental impairment."[4] Clark D. Bridges, a

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[4] Clark D. Bridges, Job Placement of the Physically Handicapped, p. 2.

professional safety and industrial hygiene engineer, states:

> From the standpoint of industrial and social economy the following definition, taken from the Peoria plan, approaches the ideal: 'A physical handicap is a difference possessed by some persons which, though limiting physically, need not limit vocationally.'

In other words, an occupational physical handicap is one of degree and the line of demarcation between the physically able and the disabled varies with the physical demands of the duties to be performed and the abilities of personnel available to discharge them.

The Billet and Qualifications Research Branch of the Bureau of Naval Personnel, in discussing the Navy's initial lag behind business, industry, and education in procurement and placement techniques and knowledges, declared that the chief problem was that of obtaining competent analysts and that wartime personnel placement could not wait upon the finding of personnel specialists.[5] As a result arbitrary and somewhat capricious physical standards coupled with numerous physical waivers were the rule. During the breathing spell of peacetime and despite reduction in funds, the Navy is training and using personnel specialists in job analysis and medical personnel in the examination and description of physical functions of naval people.

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[5] A Statement of Its Mission, Billet and Qualifications Research Division, Bureau of Naval Personnel, Navy Dept., February, 1947, p. 5.

The objective to be sought will be the profiling of the job physical demands by the job analyst on the same standard or yardstick as the profiling of the physical abilities of personnel by the medical examiner. The combination of these two experts into a personnel-medical specialist team for developing and applying a physical profiling system will be an important contribution to naval personnel administration in general and to the utilization of the physical disabled.

One of the criteria of a physical classification system for billet assignment is that it be so designed that it can be administered by people untrained as job analysts or medical experts. Detailed and technical measurements, evaluations and descriptions of physical functions must be reduced to a relatively few functional factors. The next step in developing the system is to portray graphically these standardized functional factors in physical profiles, one of the billet and one of the individual being considered for detail or utilization. In the assignment of personnel to billets the administrator of a physical classification technique should be provided with as little detail and rigidity with as much flexibility as possible.

War Problems

The great personnel administration problems of the Navy during the War were (1) the rapid mobilization of a complex

and highly technical naval organization (2) the quick conversion of civilians (with little military training) into capable naval personnel and (3) the best utilization of the manpower allocated and available to the Navy. Former casual methods of physical classification may have been adequate for the maintenance of a small peacetime Navy with only routine duties. Arbitrary standards could be insisted upon during former times of peace (and of economic depression) when the Navy, by and large, was on a volunteer and/or career basis and the service could afford the luxury of skimming off the cream of physically fit manpower.

However, during wartime personnel expansion it is especially necessary to utilize experienced and capably proven though handicapped officer personnel in those billets where their impairments would not matter, thereby releasing the more physically able officers for first line combat duty, i.e. billets demanding maximum physical abilities. During the recent war men highly qualified physically were inducted early, trained and placed in administrative jobs by 1942. Then, when the pressure of manpower shortages stepped up, they were of necessity transferred from their jobs to combat assignments. The result was an immense retraining program costly in terms of loss of time and a static body of personnel. At the end of World War II the nation was scraping the bottom of the manpower barrel.

If physically handicapped personnel had been intelligently used at the outset of the war, there would have been more ample manpower reserve in the final stages of the War.[6] Moreover, in a long war and total mobilization it would have been feasible to have utilized disabled but functionally capable personnel from the beginning.[7]

The data developed from selective service disclosed nearly 5,000,000 4-F's and revealed a serious shortage of people fit to do heavy fighting. Although the country has ample resources of combatant type personnel, if properly detailed, there would not be enough to go around if there were a continuance of misassignment of top-notch men to billets in which the physically handicapped could have performed equally well. A complex and specialized naval war machine cannot always get highly technically trained officers who are nearly perfect physical specimens to man every billet. Current job analyses reveal that the physical demands of many technical or specialized billets do not call for the perfect functioning of the entire series of physical abilities. Again, a comprehensive analysis of the physical demands of the billet is indicated as a fundamental part

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6 Minutes of the Conference on Physical Classification of Manpower, January 15, 1943, National Research Council, Division of Medical Sciences, Brig. General John Dahlquist speaking.

7 Ibid., Dr. I. S. Ravdin of the Committee on Surgery National Research Council, speaking.

of a classification structure whereby officers and men, able or disabled, could be assigned to billets in which their skills and physical capabilities could be used to the fullest extent commensurate with the Navy's needs.[8]

Economic Problems

The problem of disability pensions has been the subject of much recent discussion. An investigation of disability retirements of officers in the armed forces was conducted in 1948 by the House of Representatives' Committee on Armed Services, with the Honorable Charles H. Elston as chairman. The resulting report, known as the Elston Report, recommends as its first proposal that fitness for any kind of suitable military duty be considered first before deciding eligibility for physical disability retirement.[9] In summing up, the Elston Report states:

> In the final analysis any proper system of military retirement must accomplish justice and equity for both the beneficiaries of the system and those who must underwrite its cost. We conclude that the present system does neither.[10]

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[8] A Statement of Its Mission, Research Division, Bureau of Naval Personnel, loc. cit.

[9] Report of Investigation of Physical Disability Retirement of Officers of the Army, Navy and Marine Corps, No. 261, The Legal Subcommittee of Committee on Armed Services, House of Representatives, 1948, pp. 6043-6044.

[10] Ibid., p. 6045.

The Hook Commission 1948 on proposed changes in service pay has proposed some considerable modifications in the present retirement practices.

> The Commission has attempted to strike a balance in benefits between the present system, which is overly liberal and contrary to public interest in certain respects, and the minimum benefits which highly tax-conscious citizens might view as adequate in the light of common civilian practices. Normally an officer with 20 years of service would be around 42 years of age. It seems wholly unreasonable that such an officer should be granted retirement with a life annuity during the 10 to 15 years of age succeeding 42 when he should be at his prime in contributing the results of his years of training and experience to his government. [11]

The Hook Commission further considers:

> ...that the present rate of disability retirement pay of 75 per cent, regardless of length of service, is unduly generous and costly. Further, it is large enough to weaken the incentive of the individual to retrain and adapt himself for productive citizenship. [11]

The proposed plan provides that a periodic physical examination be conducted during the first five years of disability retirement. An officer would be returned to duty if he were found physically qualified and he had not reached 60 years of age.[12]

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[11] Fred Lardner, "The Navy on Capitol Hill", Shipmate, U. S. Naval Academy Alumni Monthly, February, 1949, p. 22.

[12] Ibid., p. 23.

Although a breakdown of pension figures by disabilities, deaths, superannuation, officers, or men is not available, some idea of total pension costs can be obtained from the following historical review of cost of previous wars up to June 30, 1946:[13]

(1) $70,000,000 paid American Revolution soldiers and their kin (account closed);

(2) $46,218,390.57 to the War of 1812 pensioners (account closed);

(3) $61,661,344.64 has gone to the Mexican War participants (51 survivors remain);

(4) $97,790,584.58 went out as the result of the Indian Wars (2,532 survivors remain);

(5) $8,129,810,888.25 was accounted for the Civil War (21,504 survivors continue to draw $903,614.65 monthly);

(6) $2,322,818,138.32 has been paid to the veterans of the Spanish-American War (survivors continue to receive $9 million a month);

(7) $5,816,468,696.09 has been spent so far on World War I pensions;

(8) $1,001,129,472.69 for World War II pensions has been paid in the first three post-war months.

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[13] Henry H. Kessler, Rehabilitation of the Physically Handicapped, p. 73.

As of January 1, 1949, there was an estimated total of 14,152 officers on the retired list, excluding retired officers on active duty and on the Honorary Retired List. Of this total 7,939 (56 per cent) officers were retired for physical disability. The estimated pensions for these physical disability retirements is about $24,000,000 yearly. Attention is invited to Appendix II; table VIII is a breakdown of the officers' retired list by type of retirement and table IX is a breakdown of physical disability retirement by ranks.

Although the specific physical causes for retirement are unavailable for the above list, a summary of physical disabilities by rank of the officers of the U. S. Navy and U. S. Naval Reserve retired over the period 10/1/45 to 11/1/47 is presented in table X of Appendix II. The descriptions are rather general. Percentagewise, diseases of the circulatory system predominate and account for 27 per cent of the grand total of 3,792 officers retired; diseases of the mind are 12 per cent; tuberculosis provides 11 per cent; diseases of the digestive system amount to 10 per cent; deformity acquired cases account for about 10 per cent; the remaining disabilities are less than 10 per cent each.

At the present time only two job analysis studies of officers billets have been undertaken where physical requirements were determined for each billet. One study is of a shore station and is known as the "prison study".

The other study is of afloat billets on a large aircraft carrier. The data for each of the two types of officer billets is presented in Appendix II, which gives a sample of naval job physical requirements (forms 1 to 12 inclusive). With a detailed breakdown of physical disabilities listed in tables XII a comparison or matching process could be made with the physical requirements of the billets. Moreover, with serviceable prosthetic devices and/or billet rehabilitation training a whole new avenue of possibilities is open in the utilization of physically handicapped officers in navy billets. The matching technique will be greatly improved when more complete and detailed job analysis coverage of naval billets is attained and when physical profiles of handicapped officers are more descriptive. If full utilization of the physically handicapped cannot be achieved by such planning within the armed forces, then disability pensions may become one of the great economic problems of the country.

Morale Problems

The reduction in financial income of the disabled pensioner is a fairly obvious problem affecting morale. Although the disability pension is liberal, at 75% of the base pay plus longevity of the rank held at retirement, the important point is that the door is shut to future promotions and increased earning potentialities in the Navy.

As an example, a married line lieutenant commander with 15 years service (experience and training) receives $511.75 per month in pay and allowances at a shore station in the United States and, if physically retired, his pension is $257.81 per month or approximately one half of his former income (all allowances are dropped). If this officer could be utilized his potential income and promotions normally could be $600.08 per month as a commander with over 18 years service and $675.33 per month as a captain with over 24 years service. Carrying the example further, the problem of what to do to augment the pension at an average age of 38 years, with 15 years of naval line experience and with the disability stigma attached, is formidable if the above officer and his family cannot adjust to the fifty per cent reduction in income.

Another point of view is revealed from a study by Henry H. Kessler who writes:

> Many men leaving the service feel insecure about the future. Some are ready to seize any financial crutch that is offered. A pension is a financial crutch. Resort to it may discourage rehabilitation and may even rouse an unconscious desire to win a larger pension by getting sicker. The present system encourages veterans to seek security in pensions instead of in gainful jobs. [14]

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[14] Ibid., p. 73.

A survey of physically retired naval officers, finding out what they are doing, how they are getting along and what their attitudes are, would be useful in discovering the existence and nature of these morale problems. Some surveys have been made in industry to find out what the attitudes of industrial and business leaders are toward physically impaired people as well as what the physically handicapped person's attitude is toward himself. Roger G. Barker makes the following summary on several rather definite trends in the data compiled from these surveys on attitudes toward physically disabled persons:

> 1. Public, verbalized attitudes toward disabled persons are on the average mildly favorable; an appreciable minority openly express negative attitudes.
>
> 2. Indirect evidence suggests that deeper unverbalized attitudes are more frequently hostile. This is a point that requires further investigation.
>
> 3. The attitudes of disabled persons toward their own disabilities have been inadequately studied. What evidence there is suggests that negative attitudes are frequent. [15]

An objective system that can utilize disabled naval officer personnel and a Navy attitude favorable to such utilization will go a long way toward promotion of the morale of the nondisabled officers already in the service

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[15] Roger G. Barker, Adjustment to Physical Handicap and Illness: A Survey of the Social Psychology of Physique And Disability, Bulletin 55, 1946, Social Science Research Council, New York, p. 277.

and contemplating a full naval career. And in all respects, good morale is as valuable to efficient personnel administration as adequate training, classification and placement.

CHAPTER III

SURVEY OF PHYSICAL CLASSIFICATION SYSTEMS

SURVEY OF PHYSICAL CLASSIFICATION SYSTEMS

A physical "profiling" system consists of essentially two parts. It is a method of describing by alphabetical, numerical, or graphic symbols 1) the functional capacities of men, and 2) the functional capacities required in the performance of jobs. It describes people and, in the same terms, it describes the jobs to which they are to be fitted. The portrayal of physical abilities is the individual person's profile while that of the physical demands of a billet is the job profile.

The contemporary physical classification system began in 1943 as the joint product of medical specialists and personnel technicians with senior personnel administrative officers working in close cooperation with both.[1] The Canadian physical profile system, started in 1943 and used from then to the present time, spread in whole or part to the British armed services, the U. S. Army, and the U. S. Air Force. These systems, called the Canadian PULHEMS, the British PULHEMS, the U. S. Army PULHES, and the U. S. Air Force's physical profile, are essentially the same, with minor variations to meet the needs of the different services. The coined word "PULHEMS" is a mnemon-

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[1] "History of PULHEMS" prepared by Headquarters of the Royal Canadian Army, Ottawa, Canada. Reproduced in mimeographed form by National Research Council, Division of Medical Science, Washington, D. C., p. 1.

ic device obtained from the first letter of each of the seven elements in a profile type classification chart.

P - Physique (includes a man's general development, height and weight, his potential capacity to acquire physical stamina with training, his capacity for work)

U - Upper Extremities (functional use of hands, arms, shoulder girdle and upper spine)

L - Lower Extremities (functional use of feet, legs, pelvis and lower spine, etc.)

H - Hearing and Ears.

E - Eyesight and Eyes.

M - Mental Capacity (ability to learn to perform army duties, native intelligence, knowledge of tools, arithmetic and the meaning of words)

S - Stability (degree of self-control and emotional "staying power" under conditions and stresses of military life)

The development and administrative application of physical classification and profile systems can be discerned somewhat from the following surveys of the five major systems.

Canadian Physical Profile Systems[2]

The Royal Canadian Army pioneered the development of the system of profiling and matching the physical characteristics of soldiers and billets. A systematic personnel selection system was needed (1) to discover just how "well"

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[2] Ibid., pp. 1-10

a man should be to perform any one of the hundreds of jobs necessary to put a modern army in action and (2) to economize in the use of manpower by using every man to his maximum capacity. The theme was that a person who was normally healthy but who had physical handicaps could be utilized in a billet where his physical handicaps would not matter. Certain physical characteristics of a healthy man may make him specially efficient in some kinds of billets but unsuitable for other types. The Royal Canadian Army has stated:

> Allocation should be based on a man's positive physical assets, while, in a negative sense, his allocation has to be limited by the physical disabilities that may debar him from certain kinds of work or even prevent him from being accepted for the Army at all. [3]

The Canadian Army employs the seven lettered classifications representing seven human functional capacities or factors described above. Except for Mental Ability (M) and Stability (S) there are five grades of functional ability, one of which is to be appended to a letter factor in profiling a soldier. Grade 1 implies normal function; grade 5 signifies total disability for army work; grades 2, 3, and 4 are used to indicate intermediate degrees of functional ability.[4]

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[3] Ibid., p. 1.

[4] Physical Standards and Instructions, 2nd. Edition, 1943, For the medical examination of serving soldiers and recruits for the Canadian Army, Amendment No. 2, p. 4.

Grade 1 under any factor indicates not "superman" ability but only that the man is fit for any army duty anywhere - under that particular factor. Grade 2 indicates fitness comparable to Grade 1, except under prolonged stress or very difficult circumstances. Grade 3 designates complete fitness provided living and working conditions are favorable and the man is used carefully, i.e. quite fit for limited types of work where conditions are least difficult or hazardous.[5] Grade 4 represents inability to assume duties in operational units but reflects disabilities that are reasonably safe from aggravation under appropriate army life in Canada. Grade 5 for any factor is reason for rejection or discharge.[6] Some examples of Canadian Army Profile Charts are illustrated in Figure 1.

The Royal Canadian Navy adopted a somewhat cruder and oversimplified three lettered classification system. The three categories are: A - full duty, B - restricted or limited duty, D - temporarily unfit. The classification of personnel by one of these alphabetical categories was in terms of the billet the man was to perform. A naval man is placed or recruited for a specific billet or trade and he is medically examined and classified in the light of such billet. Therefore a man classified as A for fireman might

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[5] C. M. Mooney, "FITNESS", Canadian Army Journal, No. 1 April 1947, p. 17.

[6] Physical Standards and Instructions, op. cit., p. 5.

Year of Birth	P	U	L	E	L	V	S
09	1	1	1	1	1	1	1

This man is fit in every way.

Year of Birth	P	U	L	E	L	V	S
10	2	2	3	3	1	1	1

Some limitations of physique and upper extremities, with more marked defects of locomotion and hearing.

Year of Birth	P	U	L	E	L	V	S
15	1	1	2	1	1	1	1

This profile indicates minor limitations of locomotion, sufficient to preclude full front line service.

Year of Birth	P	U	L	E	L	V	S
12	1	1	1	1	1	5	1

This man, while physically fit, is too low in mental ability to be useful in the army.

Year of Birth	P	U	L	E	L	V	S
14	2	1	4	5	1	1	1

Minor limitations of physique; locomotion adequate for service in Canada only; hearing sufficiently impaired to warrent rejection or discharge.

Year of Birth	P	U	L	E	L	V	S
11	5	3	3	1	2	1	1

Rejection or discharge on grounds of physique.

Year of Birth	P	U	L	E	L	V	S
16	4R	1	1	1	1	1	1

Physique limiting the man to service in Canada until remedial treatment* warrants upgrading. Otherwise fit.

*The letter "R" after a grade indicates a condition that can be remedied within three months by surgical operation or other treatment.

Figure 1. Examples of Canadian Army Profile Charts

not be classified as A for seaman or yeoman.[7]

Due to the fact that the Canadian Navy was on a volunteer system, applicants far outnumbered billets and physical standards were set arbitrarily high. In practice the B- restricted or limited classification was used very little and the man who reverted to the D- temporarily unfit class was generally discharged.

The Royal Canadian Air Force classification system was similar to the Navy. The A category was broken down to A1 for pilots, A2 for limited flying duty, A3 for air crewmen, A4 for passengers on aircraft. Category B was designated for ground duties. Class A and B were used in combinations like A_2B meaning a person detailed to ground duty but capable of limited flying duty.[8] Similar to the Navy, personnel for the Canadian Air Force were not drafted and the service had an abundance of volunteers. The D or temporarily unfit people were not utilized. Differing from the Navy system, a 10 per cent margin was allowed in the detailing of personnel to billets in terms of physical abilities.

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[7] Report of Investigation of Canadian System of Profiling Military Jobs, Unpublished report, Research Activity, Bureau of Naval Personnel, June 1949, p. 7.

[8] Ibid., p. 7.

British Physical Profile System

The British PULHEMS classification differs from the Royal Canadian Army system in three respects. First, the addition of another "E" makes for two eye factors, namely the right eye and the left eye. Second, consideration is given to climatic factors such as frigid, temperate, tropical, and subtropical regions; all eight PULHEMS items are graded in the light of climatic conditions. Third, the top rating for mental capacity and stability is M2 and S2 as against M1 and S1 in the Canadian system.

The functional interpretation of each PULHEMS item of the Royal Navy is expressed in degrees ranging from 1 to 9, a numerical degree being a suffix to the letter abbreviation for the factor. Descriptions of these degrees are as follows:[9]

Degree 1 Fit after training for full sea service in any part of the world. Able to withstand extremes of weather and climate and to remain efficient under conditions of strain and fatigue for long periods.

Degree 2 Fit for full sea service in any part of the world. Able to withstand exposure and fatigue

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[9] "PULHEMS" Naval Supplementary Pamphlet, B. R. 1750 A (47), Appendix 1 (a), Royal British Navy, p. 7.

for normal periods.

Degree 3 Fit for restricted service in any part of the world. Example: "restricted to service in a ship carrying a Medical Officer".

Degree 4 As for degree 1, but limited to temperate climates.

Degree 5 As for degree 2, but limited to temperate climates.

Degree 6 As for degree 3, but limited to temperate climates.

Degree 7 Fit to serve in a restricted capacity in home shore and harbor duties.

Degree 8 Permanently unfit for naval service.

The P[illegible]EMS assessment is reviewed annually and no person is detailed to a billet or promoted unless the assessment is "in date", i.e. dated less than twelve months before the date of the orders or promotion.[10] Temporary alterations of P[illegible]EMS assessments are made as the result of sickness and injury and are reviewed every three months unless permanent alterations or re-assessments are made. Figure 2 is an example of the physical assessment of a man in the Royal Navy.[11]

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[10] Ibid., p. 1-2

[11] Report of Investigation of Canadian System of Profiling Military Jobs., op. cit., p. 33.

Branch	On Entry	On Reenlistment
Color Perception 1 Seaman	P U L H E E M S 2 2 2 1 2 2 2 2 1 1	

This man possesses average physical stamina. He is fit for full sea service under war conditions for normal periods. The 15/20 vision is correctible to 20/20.

Figure 2 Example of grading a man in terms of his physical capacities. British Royal Navy.

U. S. Army Physical Profile System

Over the course of the past four years the United States Army has developed a PULHEEM system.[12] The mental capacity factor and stability factor have been combined in the letter "S". This factor is titled Neuropsychiatric and emotional stability, personality, and psychiatric history will be lumped together as one numerical grade for this factor.

Each individual examined is graded by a number from 1 to 5 under each of the seven categories, the numerical rating being in descending order. Each examinee is given an overall designating letter of A, B, C, or D, based on

[12] Physical Profile Serial, Supplement to MR 1-9, Mobilization Regulations, War Department, Washington, D. C. 30 June, 1945.

the lowest number grade in any one of the seven categories, this letter designation likewise corresponding to the numerical grading in descending order.[13] Examples of Army profile charts are presented in Figure 3. The following suffixes to the grade number are used as applicable:

X- to denote that the individual has had overseas service

H- to signify that the individual has a remediable physical defect under specified conditions

D- to specify a physical defect permanently disqualifying for overseas duty.

Similar to the Canadian and British systems, Army jobs are profiled in terms of the physical demands. Every billet is to be covered by this type of analysis and to be covered in light of its location, i.e. in a combat zone, in a base area, or in the continental United States. Each job is assigned a minimum PULHES profile.[14] Assignments of personnel are made by matching the individual's profile with the billet's profile.

From the physical standpoint there is an Army job for nearly everyone. But from the point of view of the

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[13] Reporting of Investigation of Canadian System of Profiling Military Jobs, op. cit., p. 36.

[14] Robert D. Potter, "The Stigma Is Lifted From the 4-Fs," The American Weekly, December 14, 1947, p. 19.

Year born	Profile serial	P	U	L	H	E	E	S
1920	1			1	1	1	1	
	2		2					
Ht. 69	3	3						
	4							4
	5							
Wt. 140	6							
	7							

This profile indicates a profile designation of D as the result of grade 4 under the S factor.

Year born	Profile serial	P	U	L	H	E	E	S
1918	1	1	1	1	1	1	1	1
	2							
Ht. 73	3							
	4							
	5							
Wt. 185	6							
	7							

This profile indicates a man above average in every way and fit for service in any theatre of war. Profile designation is A.

Year born	Profile serial	P	U	L	H	E	L	S
1910	1							
	2	2		2	2	(2)	(2)	2
Ht. 70	3							
	4							
Wt. 168	5						5	
	6					6		
	7		7					

This profile indicates a man with a low degree of function in "U" due to a rigid elbow which is ankylosed. This prohibits service as a combatant. His poor vision (grade 6 under "E") can be corrected with spectacles to grade 2. This profile may be matched with a similar job profile for a clerical function in the Army.

Figure 3 Examples of U. S. Army Profiles

neuropsychiatric or "S" factor the matching process is extremely difficult if not impossible. Psychiatric testing of people is still an equivocal and experimental technique. It would be even harder to speculate what the neuropsychiatric profile (or its equivalent) of an Army billet might be. The great difficulty is the attempt to predict just where, when, and how a specific soldier might crack up under stress. Reliable and valid tests of mental capacity of "S" factor have been developed, viz. the Army Alpha and Army General Classification tests. Combining the mental and stability factors into a single category is defective since the former capacity is fairly well known and susceptible to measurement while the measurement of the latter is still in the infancy stage. Moreover, it would be important to distinguish between the two capacities to get a truer profile of either billet or soldier.

U. S. Army Air Forces Physical Classification System

The Army Air Forces Personnel Distribution Command developed a strictly physical classification system. Both mental and emotional stability factors are omitted from the profile. Billets or military specialties were classified in terms of seven physical factors or demands with a numerical rating breakdown for each. The system,

like the others previously discussed, consists of profiling individuals according to their physical capacities, profiling military jobs in terms of physical requirements, and matching the two for personnel assignment.

The seven factors and their numerical grade are:[15]

EYES

1. Minimum - uncorrected 20/30 for each eye.
2. Minimum - from 20/30 uncorrected or 20/20 corrected to corrected 20/90 each eye.
3. Minimum - from corrected 20/90 each eye to corrected 20/100 each eye; or 20/30 uncorrected one eye, none in the other.

COLOR VISION

1. Normal.
2. None - any departure from normality.

HEARING

1. Whispered voice at 20 feet - each ear.
2. Conversational voice at 20 feet - each ear.
3. Conversational voice at 10 feet - each ear; or at 15 feet one ear and at 5 feet other ear; or at 10 feet one ear and completely deaf in the other ear.

HANDS

1. Both hands completely normal.
2. Thumb, first, and one other finger, one or both hands; or thumb and any two fingers as long as fully functional with at least partial movement of the wrist(s).
3. Complete loss of function or amputation of one hand, the other hand being normal.

ARMS

1. Both arms completely normal.
2. Partial loss of movement in one or both arms.

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15 Carroll L. Shartle, Occupational Information (1946), pp. 270-271.

3. Complete loss of function or amputation of one arm, the other arm being normal.

LEGS

1. Both legs normal.
2. Partial loss of function of one leg, the other leg being normal.
3. Complete loss of function or amputation of one leg, the other leg being normal; or partial loss of function of both legs.

TORSO

1. Complete freedom of motion of torso or trunk.
2. Partial loss of function of torso- impaired ability to bend or turn.
3. Almost complete loss of function of torso- inability to bend or turn body or trunk.

An example of a coded billet profile might be 1-1-2-1-2-1-2 signifying the job demands of 20/30 vision for each eye, normal color perception, conversational voice at 20 feet each ear, both hands completely normal, et cetera. Some of the more obvious omissions in this profile are such factors as general health, and physique, and stamina.

The innovation of the Air Forces system was that the billets were further grouped according to patterns of physical characteristics.[16] These job groupings or patterns made for a quicker and more useable placement process.

U. S. Navy Physical Classification System

Although the U. S. Navy has no physical profile system at present, much of the groundwork has been laid for the

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[16] Ibid., p. 272.

development of one. All of the previously discussed physical classification systems have been studied and analyzed with the view of adapting some of the more applicable features to the naval service. A complete knowledge of the kinds of jobs existing in an organizational structure and the qualifications to be possessed by individuals to perform these jobs effectively is almost universally recognized by both private industry and government service as the first essential tool of personnel administration. The Navy has recognized that a comprehensive classification plan "...is essentially a picture of the service as it is, arranged in an orderly fashion"[17] and "...serves as a sound factual basis for and facilitates..."[18] the selection, classification, and utilization of personnel.

The project of completely revising Navy job classifications was assigned a top priority in 1948. Preliminary research, started in May, 1948, is continuing. Problems of determining a coding structure suitable for internal Navy needs and usable by other government agencies, format of job descriptions, and relationship to the rating structure in both peace and wartime are currently being investigated.

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[17] Harvey Walker, Public Administration in the United States, p. 189.

[18] Ibid., p. 188.

The complete classification of naval billets is not the end product; the job classifications are to be revised, expanded, and maintained from time to time as a result of advanced techniques in modern naval warfare. Furthermore, the other bureaus of the Navy Department, such as Bureau of Ships, Bureau of Yards and Docks, Bureau of Aeronautics, are informed of the duties and qualifications in each naval billet under their cognizance in order that their activities may be coordinated with the prescribed functions of the Bureau of Naval personnel.[20] In this respect the Bureau of Naval Personnel in its relations to the other bureaus is the counterpart of the familiar central personnel agency as known in public personnel administration.

An ad hoc committee, composed of medical and personnel representatives of the Army, Navy, and Air Force, was sent to Ottawa, Canada in May, 1948, to study the system of profiling military occupations currently in use by the Canadian Government. As a result of this study, the Navy

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19 Bibliography of Accomplishments of Billet and Qualifications Research Branch, Fiscal Year 1948, Research Division, Bureau of Naval Personnel, p. 6.

20 A Statement of Its Mission, Billet and Qualifications Research Division, Bureau of Naval Personnel, op. cit., p. 6.

is cooperating with the other branches of the Armed Forces in the development of physical and mental profiling techniques for military jobs.[21]

At the request of the Bureau of Medicine and Surgery, the Bureau of Naval Personnel conducted, in 1948, a preliminary research on the methods of detailing physical requirements for specific naval billets for the purpose of assigning personnel according to a profile of physical characteristics. Although a physical profiling technique analogous to the systems described above for the other services was not produced, the study did result in the development of Naval Job Physical Requirements Form NavPers 2499 which will be used to reveal the environmental and functional factors inherent in all jobs analyzed.[22]

In addition to reflecting the physical requirements of naval billets, the completed Naval Job Physical Requirements Forms will aid in obtaining data for the development of more realistic and objective physical standards. The environmental and functional factors on the form harmonize with those used on the Health Qualification Placement Record which will be applied by all government agencies in determining the physical capacities of individuals

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[21] Bibliography of Accomplishments, Bureau of Naval Personnel, op. cit., p. 6.

[22] Ibid., p. 2.

employed by the Federal Government. "It is intended that the Bureau of Naval Personnel, in cooperation with the Bureau of Medicine and Surgery, will develop from these data physical standards ('profiles') required for each naval billet."[23]

To indicate the progress made in the physical classification of billets over the past two years comparison is invited to the amount of coverage of physical demands in Figure 4 (March 1947), and, the data covered in Figure 5 (December 1948). The physical demands of the billet occupy a small portion of page 1 of a six page job analysis in Figure 4, while the Naval Job Physical Requirements Form, Figure 5, is a complete section of a job analysis and covers fifty-eight factors. Examples of the new form, instructions in completing it, and definitions of the elements are presented in Appendix III.

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[23] Manual of Instruction for Naval Occupational Analysis, NavPers 10,903, Bureau of Naval Personnel, 1949, p. 35.

IDENTIFICATION EXPERT (FINGERPRINTS)

ALTERNATE TITLES: Fingerprint Officer
OFFICERS QUALIFICATIONS CODE: 078.420J
LOCATION OF BILLET: Bureau of Naval Personnel
QUALIFICATIONS:
RANK: Lieut. (jg) to Lieutenant (S) USNR
TEST SCORE PATTERN: OFFICER CLASSIFICATION BATTERY

Test	Cutting Score (PSB)
Verbal	10
Mathematical	--
Mechanical	--
Spatial Relations	85
Relative Movement	--

PHYSICAL DEMANDS:
Age: Limits not important. Desirable to have a mature and active person for field investigation work.

Sea Duty: Not a sea duty billet. May require boarding ships off shore before docking.

Other Factors: Billet involves supervision of others and ability to give oral testimony as expert in court. May involve some moving or lifting of heavy objects in searching for fingerprints during field investigations. Searching for latent fingerprints involves continued use of eyes in identifying blurred or indistinct fingerprints under average lighting conditions.

PERSONAL CHARACTERISTICS:
Ability to meet and deal with people effectively is desirable, as the officer represents the Navy at conferences, field investigations, and courts of law.

Figure 4 Example of page 1 Navy Job Analysis Form, March, 1947.

(From Billet and Qualifications Research Division, Research Activity, Bureau of Naval Personnel.)

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE 12-1-48

NAVAL JOB TITLE [illegible] SCHEDULE NO. [illegible]-44

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	85% in office, classroom and shop
✓	2 OUTSIDE	15% escorting details on station
-	3 EXCESSIVE HEAT	
-	4 EXCESSIVE HUMIDITY	
-	5 EXCESSIVE COLD	
-	6 EXCESSIVE DAMPNESS OR CHILLING	
-	7 DRY ATMOSPHERIC CONDITIONS	
-	8 EXCESSIVE NOISE INTERMITTENT	
-	9 CONSTANT NOISE	
-	10 DUST	
-	11 ASBESTOS, SILICA, ETC.	
✓	12 SMOKE, FUMES OR GASES	Carbon monoxide-moderate daily contact.
✓	13 SOLVENTS	Gasoline-moderate daily contact.
✓	14 GREASES AND OILS	
-	15 RADIANT ENERGY	
-	16 ELECTRICAL ENERGY	
-	17 SLIPPERY OR UNEVEN WALKING SURFACES	
-	18 MOVING OBJECTS OR VEHICLES	
✓	19 WORKING AROUND MACH. WITH MOVING PARTS	2 hrs. daily in shop.
-	20 WORKING ON LADDERS AND SCAFFOLDING	
-	21 HIGH PLACES	
-	22 WORKING BELOW GROUND	
+	23 EXPLOSIVES	Works near gasoline.
-	24 VIBRATION	
✓	25 WORKING CLOSELY WITH OTHERS	Close contact with 35 prisoners.
-	26 WORKS ALONE	
-	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
-	28 UNUSUAL FATIGUE FACTORS (Specify)	
-	29 SPECIAL CLIMATE FACTORS (Specify)	

	FUNCTIONAL FACTORS	REMARKS
-	30 HEAVY LIFTING 45-100 LBS.	
-	31 MODERATE LIFTING 15-45 LBS.	
-	32 LIGHT LIFTING UNDER 15 LBS.	
-	33 HEAVY CARRYING 45-100 LBS.	
-	34 MODERATE CARRYING 15-45 LBS.	
-	35 LIGHT CARRYING UNDER 15 LBS.	
+	36 WALKING	Majority of time observing work.
+	37 STANDING	Majority of time observing work.
-	38 CRAWLING	
-	39 KNEELING	
-	40 PULLING-STRAIGHT	
-	41 PULLING-HAND OVER HAND	
-	42 PUSHING	
-	43 REACHING ABOVE SHOULDER	
✓	44 USE OF FINGERS	Demonstrating use of tools.
✓	45 BOTH HANDS REQUIRED	Demonstrating use of tools.
-	46 REPEATED BENDING	
-	47 CLIMBING, LEGS ONLY	
-	48 CLIMBING, USE OF LEGS AND ARMS	
-	49 BOTH LEGS REQUIRED	
-	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
✓	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	Operation of power tools.
-	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
✓	53 SPECIFIC VISUAL REQUIREMENTS	Sufficient acuity to work close tolerances
-	54 BOTH EYES REQUIRED	
-	55 DEPTH PERCEPTION	
-	56 ABILITY TO DISTINGUISH BASIC COLORS	
-	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
✓	58 HEARING REQUIREMENTS (Specify)	Sufficient acuity to distinguish engine sounds.

ADDITIONAL COMMENTS

Duties are performed in Disciplinary Barracks in enclosed and guarded area.

B-2345

CHAPTER IV

METHOD

Figure 5 Example of the Naval Job Physical Requirements Form NavPers 2490

(From Manual of Instructions for Naval Occupational Analysis, Bureau of Naval Personnel, p. 36a.)

CHAPTER IV

METHOD

METHOD

Two approaches can be considered in the utilization of physically handicapped officer personnel: one is to fit the billet to the individual (job reengineering), the other is to fit the individual to the billet (matching the officer to a suitable billet). In either approach successful employment is possible. Since most of the requisites of naval billets are dictated by the progressive developments in naval warfare and since physically impaired officers constitute a distinct minority in the reservoir of officer personnel, it is believed that the approach of matching the officer to the billet is the most practical and advantageous method for making use of disabled officers.

For a specific method of determing officer billet requirements in relation to the physical capacities of naval officers, the job analysis method is perhaps the most important one yet developed. Job analysis may be defined as the process of (1) securing, through observation and study, pertinent facts and information concerning jobs and (2) presenting this data in a form most suitable for the use specified.

The relevant information about jobs is of two basic kinds:

(1) Information concerning the task involved in the job.

(2) Information concerning the skills, knowledges, responsibilities and abilities required of the worker for successful performance of the tasks.

The analysis of any job therefore consists of: (1) completely and accurately defining the job, (2) completely and accurately describing the tasks of the job, and (3) indicating the requirements the job makes upon the worker for successful performance.[1]

The uses to which these data may be put include: recruitment and placement of personnel; vocational counseling; job and employee evaluation; training; and furnishing data concerning the job physical demands to medical specialists enabling them to decide whether or not a disabled person or one possessing physical limitations can perform the duties of the job. It is with this last mentioned use that this thesis is concerned. The subsequent sections of this study will take up the methods for classifying billets according to their physical requirements, for classifying individuals according to their physical abilities, and the technique for matching the one with the other.

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[1] Training and Reference Manual for Job Analysis, U. S. Employment Service, Department of Labor, June, 1944, p. 1.

Classification of Billets

In dealing with the suitability of billets for physically handicapped officers, surveying the physical demands of billets is the first requisite. Applying the existing techniques of job analysis, these surveys take the form of job appraisals which are especially adapted to the determination of minimum physical requirements for each billet. A check-list form for appraising the functional and environmental factors inherent in naval billets is recommended as a systematic procedure for obtaining the pertinent facts for use in matching personnel to billets.

The Naval Job Physical Requirements Form, described in Chapter III (Figure 5), with its accompanying instructions and definitions (Appendix C), comes the closest to giving an accurate word picture of these physical demands. It meets the requirements of an adequate job appraisal form, namely: (1) rapid identification of the relevant elements involved in performance, (2) evaluation of the factors in terms of significance, time, and applicability to the particular billet, and (3) definition of items in a standard terminology understandable to the medical specialist who must appraise the officer in terms of these physical demands, to the job analyst who must appraise the billet, and to the personnel specialist who must match the officer with the billet.

After the development of the job appraisal instrument, the next process in classifying billets is making the job appraisal. Appraisers should be instructed in the meaning of the various factors on the form and indoctrinated in the need for objectivity in observing and rating the factors. In completing the appraisal form the analyst first inserts the naval job title by which the billet is commonly known and referred to, the date of the appraisal, schedule number, and other administrative data. The next step is to identify and check the factors involved in and essential to the performance of the billet. The final step consists of evaluating the checked factors in terms of quantity, quality, time, or severity.

These job appraisals should be reviewed by a qualified medical and job analysis specialist team. The tendency of beginning job appraisers is to overvalue or overemphasize the physical demands of billets.[2]

The job analyst should be trained in the critical appraisal of the physical activities required on the job, not those activities which may be possessed or performed by a particular individual on the job at the time.[3]

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[2] Clark L. Bridges, Job Placement of the Physically Handicapped, p. 37.

[3] Carroll L. Shartle, Occupational Information, p. 277.

For example, the incumbent worker may prefer to stand rather than sit although the job may be capable of being executed in a sitting position; he may use two hands in his work merely because he has two hands. Hearing and seeing are almost invariably considered essential to job performance.[4] A critical review by the expert team mentioned above may be necessary to determine whether vision and hearing is essential or not, and if so, to what degree.

From the completed job appraisal form a physical profile chart of the job can be developed by reducing and translating the some fifty odd factors into five or six categories of bodily functions or parts. Each category can be identified by a letter similar to the profile systems surveyed in Chapter III: P for physical capacity or stamina- height, weight, lungs, heart, general development; U for upper extremities- hands, fingers, arms, shoulder girdle; L for lower extremities- legs, feet, lower spine; H for hearing; and E or EE for vision or eye(s). The grading of each category can be indicated by numbers in descending order, by letters of the alphabet in ascending order, or by a graphic presentation on a bar chart. The writer suggests the bar charting of the physical profile because (1) finer graduations can be made on either axis, (2)

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[4] Clark D. Bridges, loc. cit.

possibilities are opened up for weighting factors by using arithmetic, geometric or logarithmic scales, and (2) matching the individual's profile with the job profile by superimposing the one on the other is a quicker and simpler process. A typical physical profile chart is shown in Figure 6.

After the individual physical appraisal of naval jobs is complete, the billets can be further classified into broader general groups on the basis of their physical requirements. Such groupings might be by areas: limited duty billets afloat, limited duty billets at advanced bases or on foreign shores, and limited duty within the continental United States. Within an area, a functional breakdown of a billet could be made, such as limited primary duties, limited collateral duties, and limited combatant or military duties (battle stations). Moreover, naval billets can be classified according to whether certain physical abilities are not required or where certain physical limitations do not matter. In other words, naval officer jobs can be coded and classified according to disabilities or handicaps. A list could be compiled of jobs suitable to personnel with orthopedic handicaps, of jobs suitable for those with vision defects, et cetera.

As billets are analyzed and profiled for physical demands, a file of graphic portrayals of billets for

OFFICER BILLET PHYSICAL PROFILE

Title.Disbursing.(CV.CVS.BB.CA).
Classification.....4-2.....
Profile Code.....22121.....

Remarks	Standard Score	P	U	L	E	N	E
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						

Figure 5. Example of a Billet Physical Profile Chart

every naval activity could be maintained and kept up to date when changes in job physical requirements take place. Every station, ashore or afloat, would know the physical profiles of its billets and also the billets that were suitable for the various classes of disabled personnel.

The Research Division of the Bureau of Naval Personnel has been developing a manual of Officer Navy Job Classifications consisting of officer job definitions, numerical codes, and standard titles.[5] A coded physical profile of each job could be incorporated in this manual. Moreover, a section of the Manual could be devoted to classifying billets according to their physical profiles or suitability for officers with various disabilities.

Physical Classification of Individuals

The physical classification of officers is as important as is their classification by specialties, skills or functions. It is mandatory, if any attempt is to be made suitably to utilize the physically handicapped. Selective billet placement of disabled officers depends upon the evaluation of their capacities and limitations in terms of the physical demands of suitable jobs. The basis for efficient

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[5] Bibliography of Accomplishments of Billet and Qualifications Research Branch, Fiscal Year 1949: Research Division, Bureau of Naval Personnel, p. 4.

utilization of disabled officers is the salient fact that "...very few jobs require all the physical abilities of a man" and "...most disabled persons have more ability than disability."[6]

The rating of abilities and the identification and appraisal of disabilities as to character, scope, and significance to billet requirements are important aspects of the general physical examination. This portion of the examination should be pointed toward the selective placement of physically impaired officers in the kinds of billets where decreased ability or significant handicaps are inconsequential.

The instrument for identifying and evaluating the physical factors, and the parts and bodily functions involved, is the physical capacities appraisal form. This form is the counterpart of, and contains the same environmental and physical demand factors as the job appraisal form discussed above. It is supplementary to the physical examination report in much the same way as the job appraisal is to the job analysis. A check-list form is again recommended as a systematic procedure for identifying and rating the human physical factors that are significant from the job standpoint.

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[6] Clark D. Bridges, op. cit., p. 74.

As in the job appraisal form, the list of items in the physical capacities appraisal form must be in the same standard terminology, understandable to and useable by both the medical examiners and the personnel placement specialist. This mutual agreement can only result from the joint effort of the medical-personnel specialist team. The examination and physical assessment is made by medical doctors.

Before there can be agreement between the physical classification of individuals and the physical classification of billets there must be agreement within the medical profession as to the functional factors and physical disabilities involved in the appraisal. The question of what is a disability has not often been answered, or, if answered, has been answered incorrectly. By disability could be meant the loss or lessening of the power to do any normal physical act. If by reason of a handicap an officer is unable to perform the tasks of any of the many naval officer billets then he has a disability.[7] In attempting to get mutual understanding concerning disabilities and standard terminology, the Royal Canadian Army has taken the "disability" of flat feet as an example:

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[7] Physical Standards and Instructions, 2nd Edition, 1943, for the medical examination of serving soldiers and recruits for the Canadian Army, p. 100.

> Flat feet- the longitudinal arch varies in height as a normal inherited feature. A perfectly competent low arch is not to be confused with true 'flat feet', which, being due to the giving way of the supporting ligaments and muscles under strain, is usually accompanied by symptoms. Consequently, if a low arch is found incidentally during examination, and there is no history of attacks of foot strain, grading is not thereby affected, and the condition should not be recorded as 'flat foot', but as 'low normal arch'. Judgement is based on function, not upon anatomy, and the foot history is much more important than the mere appearance of 'flat feet'. [8]

Evaluation of physical factors should be based primarily on function, i.e. the ability to perform the duties of the billet involved. To this end the doctor must become acquainted with the physical demands of jobs. Moreover, the process of evaluating physical functions medically involves a close relationship between selective personnel placement and physical grading.

From the physical capacities appraisal form a physical profile chart of the individual can be developed by condensing the functional and environmental factors on the form to the same five or six categories of bodily functions or parts as are shown on the profile chart. Each category has the same meaning as the categories on the job profile, is symbolized in the same manner (PULHEE) and is graded on the same scale of values. Figure 7 is an example of an individual's physical profile.

The profiles of handicapped officers can be coded and

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[8] Ibid., p. 44. Underscoring mine.

OFFICER PHYSICAL PROFILE CHART

Name.....
Rank.....File No.....
Classification.....C-4.....
Profile Code.....324133.....

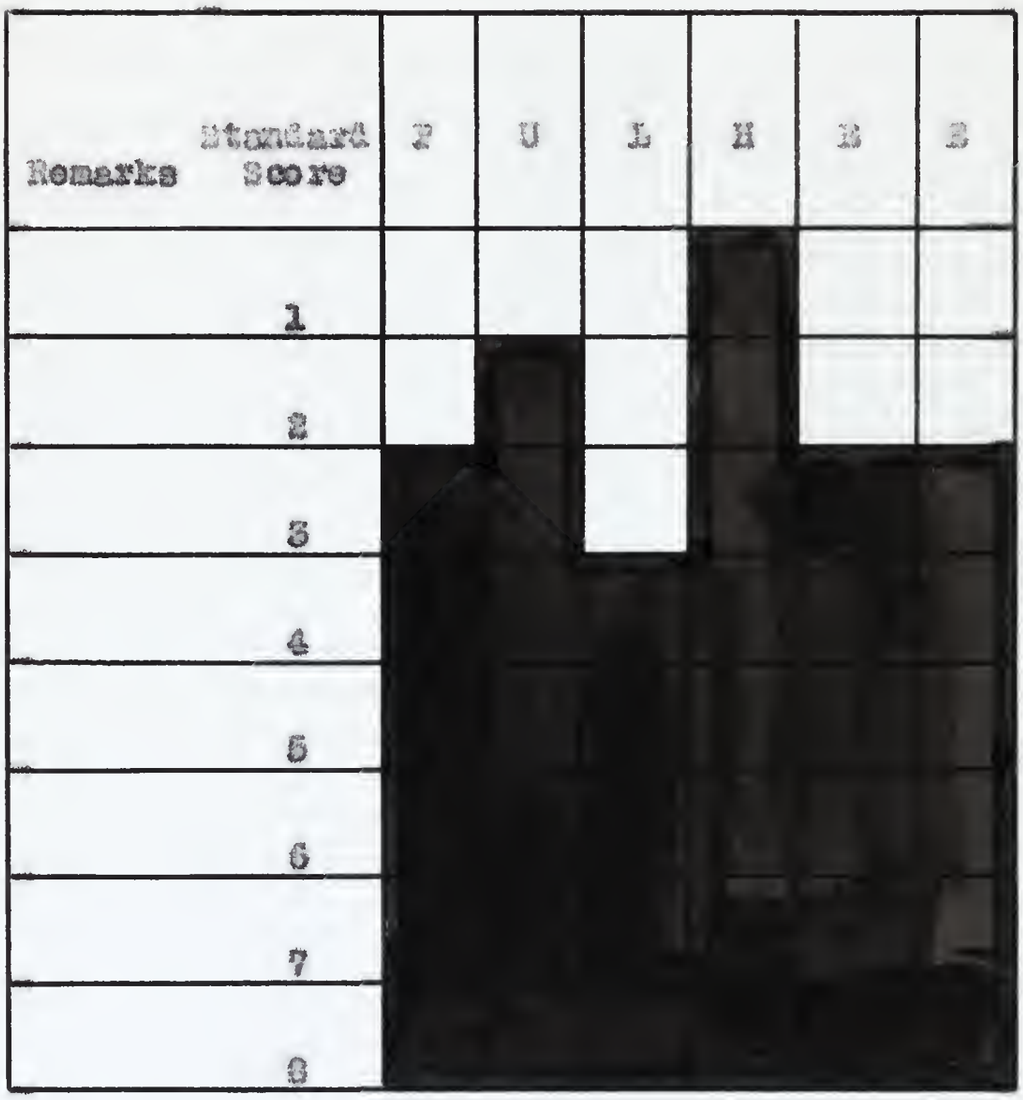

Figure 7. Example of an Officer Physical Profile Chart

classified in terms of suitable billets. In other words by matching the individual's profile or code with similar profiles or codes of billets, the physically impaired officer can be classified as competent for the equivalent limited duty billets by area, by functions, or by specific jobs.

Each individual's profile becomes a part of his medical record. It is corrected or modified when changes in physical capacities occur and it is reviewed at least once a year at the time of the person's annual physical examination.

Matching Individual to Billet

The physical profile of the billet and the individual are the common denominator that expresses in the same terms the physical demands of the job and the physical capacities of the man. Both are coordinated pictures of physical functions rated as to significance and effectiveness on the same scale of values. The purpose of a profiling system is to aid, in general, the assignment and placement process; specifically it leads the personnel officer to a list of billets which the disabled individual is physically able to perform.

One of the problems in the utilization of physically handicapped officers is the establishment of a satisfactory assignment device. The system of profiling jobs

and personnel and fitting the one profile to the other is designed to accomplish an adequate placement of the individual in terms of his physical capacities in relation to the job requirements for those capacities.

The numerical or alphabetical classification code of a disabled officer can be compared or matched with the most suitable physical classification code of billets. Coded group classifications of disabilities can be matched with similar coded group classifications of billets for specific types of physical handicaps. When coded profiles are made a part of the billet specifications or billet definitions in the Manual of Officer Navy Job Classifications, the matching procedure becomes feasible, with simplicity and speed. The personnel officer undertaking the matching technique wants as little detail as possible, with great flexibility and little rigidity. The detail officer administering the profiles probably will not be expert in either job analysis or the physical assessment of personnel. Detailed and technical medical descriptions, measurements, and gradations of functions are condensed into a profile portraying relatively few functional factors. The matching process can be made more flexible by allowing a margin of tolerance, percentage-wise, in any particular category of functions.

Perhaps the most elementary matching process is merely superimposing the individual's graphic profile upon any graphic billet profile for comparison purposes. When the

profile of both job and man are of the same form size and on the same scale of values, a translucent graph of the individual's physical profile can be placed on top of the billet profile. The bars of the graphic job profile will show through on the scales of the individual's profile in case of a misfit. This rudimentary matching technique is illustrated in Figure 8.

OFFICER PHYSICAL PROFILE CHART

Name.....
Rank.....File No.....
Classification...A-3.....
Profile Code.....312122.....

Remarks	Standard Score	P	U	L	H	E	E
	1						
	2						
	3						
	4						
	5						
	6						
	7						
	8						

Figure 8. Matching the Individual's Profile to the Billet Profile.

OFFICER BILLET PHYSICAL PROFILE

Title.....
Classification...Br4.....
Profile Code.....324122.....

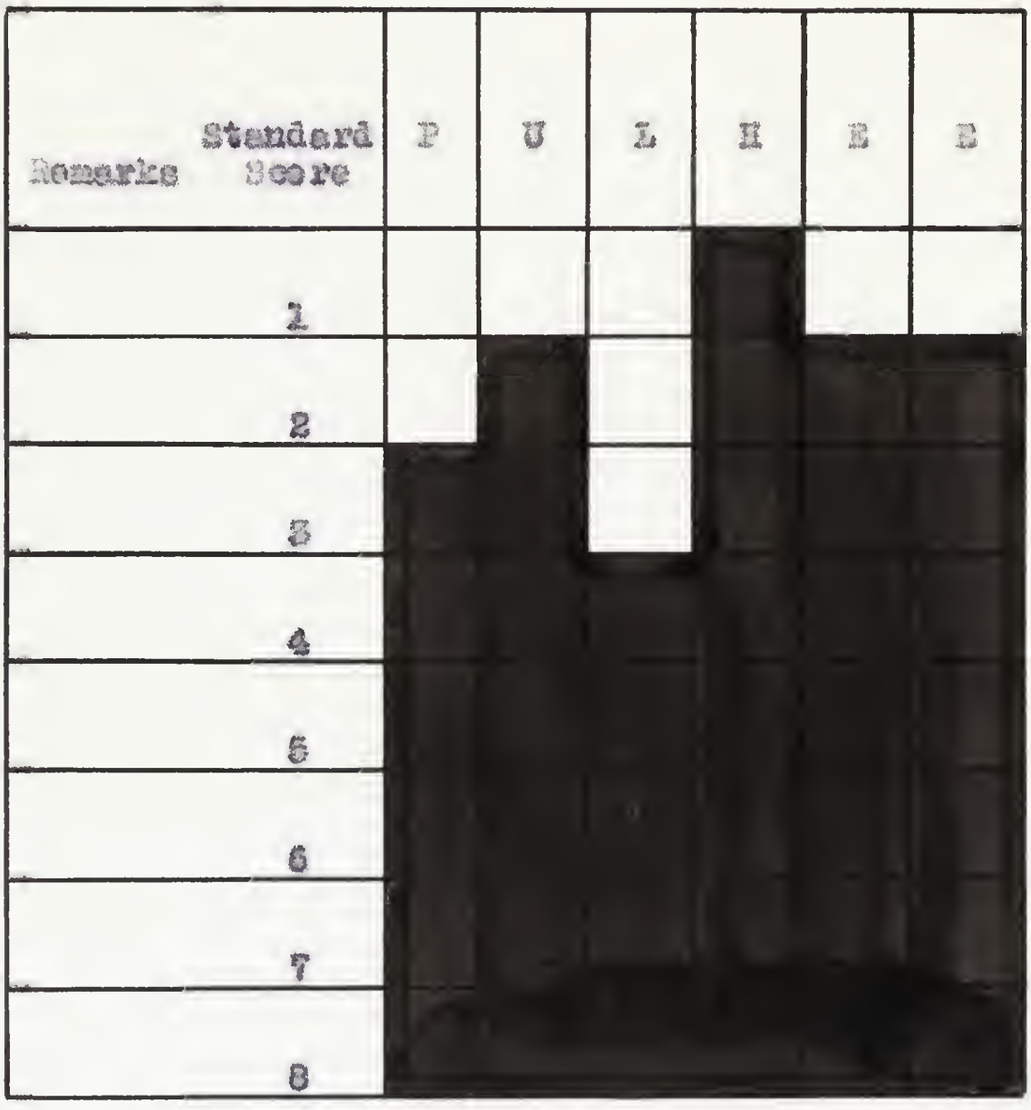

Figure 8. Matching the Individual's Profile to the Billet Profile.

CHAPTER V

SUMMARY AND CONCLUSIONS

OFFICER BILLET PHYSICAL PROFILE

Title.....
Classification...Brt.....
Profile Code.....324122.....

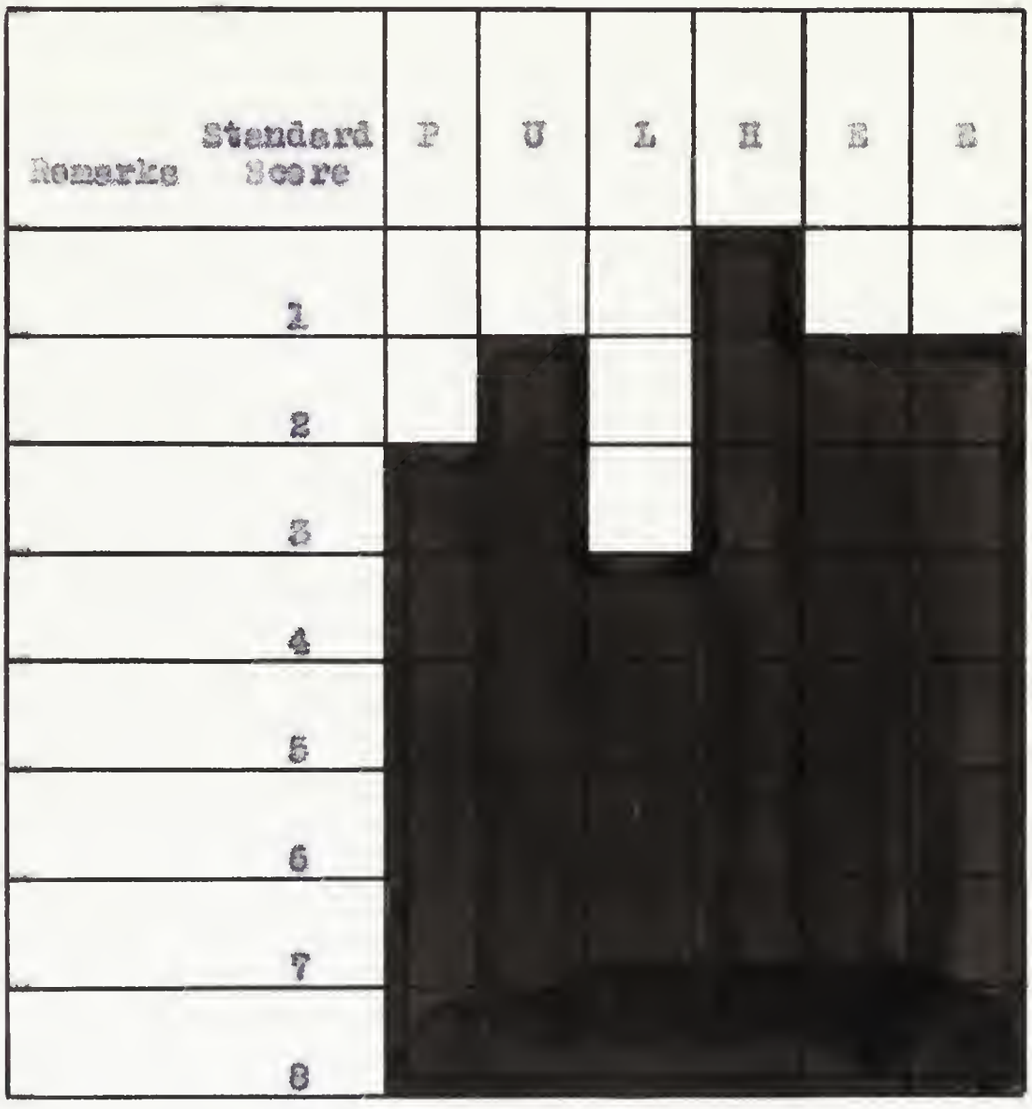

Figure 8. Matching the Individual's Profile to the Billet Profile.

CHAPTER V

SUMMARY AND CONCLUSIONS

SUMMARY AND CONCLUSIONS

The system of physical assessment, called the physical profile, was developed primarily as a solution to the high rate of rejection of recruits at the outbreak of World War II and the diminishing manpower pool. As the result of the dismissal of 4,250,000 out of 14,494,000 inductees because of physical deficiency it became apparent that the physical fitness of the Nation was not on a par with the mobilization standards of the armed services.[1] Rather than reengineer military jobs to fit the physically deficient, the various services, individually and jointly, have sought to fit the available personnel to the military jobs as they are.

Although the profile classification method is designed principally as an aid in the recruitment, selection, and assignment of personnel, it seems evident that, with proper refinement aimed at utilizing physically handicapped officers, this method cannot fail to prove superior to former unscientific and arbitrary methods of physical assessment.

Several surveys of industrial establishments having a policy of employing physically impaired workers indicate

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[1] Major Paul Bertrand, "Physical Profiles and Army Careers", Army Information Digest, Vol. 4., No.3, March, 1949, p. 29.

fairly conclusively that "...this group contains a source of labor which many companies have found to be very desirable"[2] from the standpoint of higher efficiency on the job, lower absenteeism, lower injury frequency, and lower labor turnover.

The need for retaining and using disabled officers in the service is pointed up by: (1) the growing pension costs of pursuing a contrary policy, (2) the waste of experienced and trained though partially handicapped officer personnel and (3) the decline in morale among the non-handicapped officers working in a service that does not adequately "take care of its own" in the event of a physical disability.

Chapter III briefly surveys the physical classification systems of the Canadian, British, and United States military services which have done research in this field. Their methods of physically profiling billets and personnel as well as the application of their systems to the utilization of the physically handicapped are described. The successful adoption of a similar physical classification system in the Navy would seem to be indicated as a result of these pioneer systems.

The method of profiling the physical demands of jobs and the physical abilities of personnel and fitting the one to the other is offered in Chapter IV as a solution to the

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[2] Michael J. Jucius, Personnel Management, p. 606.

problem of using physically handicapped officers in suitable Navy billets. Such a system could be easily employed by the Navy inasmuch as the preliminary work already has been done. The Navy is well along the road toward completion of the analysis, appraisal, and classification of officer billets. Job specifications are being prepared showing actual physical demands which each job makes on the officer.

The uncompleted and remaining steps in this process of selective placement of officers in the Navy is (1) the profiling, coding, and classification of this billet information, (2) the development of a profile chart or code of the physical characteristics of officer personnel, and (3) the fitting of the disabled officer to the appropriate billet. These last steps require the effort of medical and personnel specialists working as a team.

The real goal in utilizing handicapped officers is assignment so as to use the individual's skill to the maximum for the benefit of both the Naval Service and Navy officer. In order to accomplish this selective placement of the impaired officer with any degree of success, it is necessary to match the remaining physical capacities of the officer with the physical demands of a suitable billet. A suitable instrument in this procedure is the physical profile.

The emphasis throughout this thesis has been the need for a functional approach to solve the problem of the

employment of disabled naval officers. Although there has been no application of the suggested method of profiling and classifying billets and officers in U. S. Navy, the results of such a system in industry and in the other military services would seem to augur well for the probable success of the system in the Navy.

Selective placement, through physical classification of officers who have become disabled in the service, would be particularly easy, since in the case of these officers their previous training, skill, aptitude, general intelligence, and interests already have been taken into account.

There is a popular argument that the sea-shore rotation of duty would be upset if a method of utilizing physically handicapped officers in Navy billets was adopted. The inference in this reasoning is that disabled officers can only be used ashore within the United States. Although the affirmation or denial of this contention could be quite properly the topic of another thesis or study, it is believed that this problem was not manifest as the result of introducing WAVE officers in the Navy shore establishment. Moreover, the conjecture that there may be some billets afloat that could be filled by officers with certain physical handicaps cannot be denied since no substantial investigation has been made on this score. However, only through scientific methods, such as job analysis, can the physical requirements of billets,

afloat or ashore, be revealed and the possibility of using physically impaired officers be ascertained.

The matching of job and officer profiles is no quick panacea for making use of physically handicapped officers in Navy billets. Back of this system as behind any new method of classification and selective placement, is the long hard road of (1) complete analyses of all the various types of officer jobs in the peace time and wartime Navy, (2) the appraisal and classification of these billets and the officers to fill them, (3) the experimentation period, and finally, (4) the continuous follow-up and evaluation of results. The goal is to provide <u>every</u> officer with an opportunity to perform that particular part of the Navy's mission for which he is best adapted.

APPENDIX A

APPENDIX A

A Survey of Performance of the Physically Handicapped in Industry [1]

The most recent and comprehensive study of the work performance of physically impaired workers as compared with the nonimpaired workers on similiar jobs was conducted by the Bureau of Labor Statistics in 1946 and 1947. The performance records of 11,028 handicapped workers was matched with that of 18,259 nonhandicapped workers in 1,489 occupations in 109 establishments with wide distribution both geographically and as to type of industry. Types of serious physical impairments selected for study were orthopedic, vision, hearing, hernia, cardiac, extuberculous, peptic ulcer, diabetic, epileptic, and multiple (i.e. combinations of any two of these).

To permit valid conclusions the statistics were compiled from industry's own records. The difference between impaired and unimpaired individuals was centered entirely on the existence of the physical handicaps. Alike in every other respect, the handicapped worker was matched with one or more nonhandicapped workers performing the same kind of job in the same plant under identical conditions. "An im-

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[1] The Performance of Physically Impaired Workers in Manufacturing Industries, U. S. Bureau of Labor Statistics, Bulletin No. 923, 1949, vii 133 pp.

paired worker who could not be matched with someone of his own approximate age and work experience in the same plant department was excluded from the survey."[2]

The general conclusions reached were that seriously impaired people, whose job assignment is such that what they can do is emphasized rather than what they cannot do, are as desirable (and in many respects more desirable) as workers who are not physically handicapped.[3] The implication is not that all disabled workers are desirable; but neither is every nonhandicapped employee a good worker. The point is that the handicap per se does not make the impaired individual a less efficient worker.

The specific findings, summarized in Table I, are as follows:[4]

(1) Absenteeism of impaired workers was 3.8 days per 100 scheduled workdays as against 3.4 days for the unimpaired--an insignificant difference of about 1 more lost day per year for the impaired worker.

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2 Work Performance of Physically Impaired Workers, Monthly Labor Review, U. S. Bureau of Labor Statistics, January 1948, Vol. 66, No. 1, p. 31.

3 Rehabilitation and Placement of Handicapped Workers, Monthly Labor Review, U. S. Bureau of Labor Statistics, September 1948, Vol. 67, No. 3, p. 285.

4 Work Performance of Physically Impaired Workers, op. cit., p. 32.

(2) The impaired employee was as safe as his matched unimpaired colleague in terms of nondisabling injury frequency rate.

(3) The record for disabling injuries (i.e. frequency rate, time-lost rate, and average days of disability) was better for the handicapped than the nonhandicapped.

(4) The measure of efficiency was 101 for the impaired as against 100 for the unimpaired, not a significant difference, but indicating at least equivalent efficiency.

(5) Handicaps did not cause workers to be hazards to themselves or to fellow workers. No case could be found:

(a) Where a disabled worker suffered another severe permanent disability

(b) Where a temporary injury to an impaired worker could be traced to his original handicap or

(c) Where the impairment of a handicapped employee caused an injury to a fellow worker.

(6) The frequency rate of visits to plant medical facilities average about the same for both groups in each plant.

(7) The most important difference was the larger

> quit rate for the impaired worker. The Bureau of Labor Statistics points out that some impaired workers entered employment during the war with no intention of remaining during peace time, that many anticipated lay-offs when plants shifted back to normal and transferred to the still available jobs of longer tenure, and that some had acquired marketable skills which they could and did sell in return for better jobs.

The physical standards of most plants were lowered during World War II because of the pressure of war production schedules and the scarcity of any kind of worker in the labor market. However, with the end of the war many establishments reinstated their former exclusion policies in the hiring of physically handicapped workers. Only 25 of the 100 surveyed plants had specific policies of not excluding handicapped applicants.

A few industrial plants excluded all disabled employment aspirants. Many of the establishments, for one reason or another, discriminated against persons with particular types of disabilities. The most amazing aspect of these specific exclusion policies was the inconsistency that existed among plants; one group of plants in the same industry would exclude individuals having a particular impairment that another group would hire. Moreover,

Table I COMPARISON BETWEEN WORKERS WITH SERIOUS PHYSICAL IMPAIRMENTS AND MATCHED UNIMPAIRED WORKERS

Factor	Number of workers		Average performance	
	Impaired	Unimpaired	Impaired	Unimpaired
Absenteeism				
Frequency rate 1	11,028	18,258	3.8	3.4
Nondisabling injury				
Frequency rate 2	10,858	18,001	9.9	9.9
Disabling injury:				
Frequency rate 3	10,973	18,202	8.9	9.5
Time-lost rate 4	10,973	18,202	0.10	.11
Days disabled 5	----	----	14.5	14.9
Output relative 6	895	1,404	101.0	100.0
Quit rate 7	5,217	8,783	3.6	2.6

Notes:
1 Number of days lost per 100 scheduled workdays.
2 Number of injuries per 10,000 exposure-hours.
3 Number of injuries per 1,000,000 exposure-hours.
4 Number of days lost for disabling injury per 100 scheduled workdays.
5 Number of days of disability per disabling injury.
6 Percentage relationship of production efficiency of impaired to that of matched unimpaired.
7 Number of voluntary quits per 100 employees in the survey group.

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 3, Bulletin 923, U. S. Bureau of Labor Statistics)

Table Ia Number of Physically Impaired Workers of the Survey Group, by Type of Impairment

Type of impairment	Number of workers	Type of impairment	Number of workers
Total	11,028	Hernia	3,843
Orthopedic	1,522	Cardiac	1,840
Amputees	484		
Loss of use	761	Ex-tuberculous	813
Back Deformity	214		
Multiple	63	Peptic ulcer	428
Vision	1,721	Diabetic	144
Hearing	595	Multiple, etc.	721

Table Ib Number and Percentage Distribution of Impaired Workers of the Survey Group, by Age

Age group	Number of workers	Percent
Total	11,028	100.0
Under 20 years	79	.7
20 and under 25 years	511	4.6
25 and under 30 years	901	8.2
30 and under 35 years	1,117	10.1
35 and under 40 years	1,184	10.7
40 and under 45 years	1,238	11.2
45 and under 50 years	1,312	11.9
50 and under 55 years	1,562	14.2
55 and under 60 years	1,543	14.0
60 and under 65 years	1,088	9.9
65 and under 70 years	370	3.4
70 and under 75 years	96	.9
75 years and over	27	.2

(From The performance of Physically Impaired Workers in Manufacturing Industries, Table Ia p. 12, Table Ib p. 15, Bulletin 923, U. S. Bureau of Labor Statistics)

there existed the internal contradiction of a plant's policy in that an employee who was physically disabled during employment was kept on as an experienced and efficient worker whereas the equivalently disabled applicant of matched experience and efficiency would be excluded from employment.

The following tables show the statistical data, similar to Table I, for specific impairments.

Table II COMPARISON BETWEEN WORKERS WITH SERIOUS CARDIAC IMPAIRMENTS AND MATCHED UNIMPAIRED WORKERS

Factor	Number of workers		Average performance	
	Impaired	Unimpaired	Impaired	Unimpaired
Absenteeism Frequency rate 1	1,840	3,055	4.7	3.8
Nondisabling injury Frequency rate 2	1,820	3,025	10.0	10.7
Disabling injury:				
Frequency rate 3	1,840	3,055	10.2	9.3
Time-lost rate 4	1,840	3,055	0.11	.09
Days disabled 5	---	---	14.0	12.0
Output relative 6	236	329	102.4	100.0
Quit rate 7	836	1,376	4.4	2.7

Notes:
1 Number of days lost per 100 scheduled workdays.
2 Number of injuries per 10,000 exposure-hours.
3 Number of injuries per 1,000,000 exposure-hours.
4 Number of days lost for disabling injury per 100 scheduled workdays.
5 Number of days of disability per disabling injury.
6 Percentage relationship of production efficiency of impaired to that of matched unimpaired.
7 Number of voluntary quits per 100 employees in the survey group.

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 35. Bulletin 823, U. S. Bureau of Labor Statistics)

Table IIa Number and Percentage Distribution of Cardiac Cases Compared With Other Impaired Workers, by Age.

Age group	Number of workers		Percent	
	Cardiac cases	Other Impaired	Cardiac cases	Other Impaired
Total	1,840	9,188	100.0	100.0
Under 20 years	33	46	1.8	.5
20 and under 25 years	134	377	7.3	4.1
25 and under 30 years	210	691	11.4	7.5
30 and under 35 years	211	906	11.5	9.9
35 and under 40 years	164	1,020	8.9	11.1
40 and under 45 years	200	1,038	10.9	11.3
45 and under 50 years	186	1,126	10.0	12.3
50 and under 55 years	205	1,389	11.1	14.8
55 and under 60 years	236	1,307	12.8	14.2
60 and under 65 years	173	915	9.4	9.9
65 and under 70 years	90	403	4.9	4.4

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 54, Bulletin 923, U. S. Bureau of Labor Statistics)

Table III COMPARISON BETWEEN WORKERS WITH SLIGHT ORTHOPEDIC IMPAIRMENTS AND MATCHED UNIMPAIRED WORKERS

Factor	Number of workers		Average performance	
	Impaired	Unimpaired	Impaired	Unimpaired
Absenteeism				
Frequency rate 1	1,522	2,463	3.8	3.4
Nondisabling injury				
Frequency rate 2	1,482	2,402	9.4	10.0
Disabling injury:				
Frequency rate 3	1,499	2,439	5.9	8.9
Time-lost rate 4	1,499	2,439	.07	.10
Days disabled 5	---	---	15.8	13.9
Output relative 6	121	193	101.3	100.0
Quit rate 7	632	1,019	3.7	2.9

Notes:
1 Number of days lost per 100 scheduled workdays.
2 Number of injuries per 10,000 exposure-hours.
3 Number of injuries per 1,000,000 exposure-hours.
4 Number of days lost for disabling injury per 100 scheduled workdays.
5 Number of days of disability per disabling injury.
6 Percentage relationship of production efficiency of impaired to that of matched unimpaired.
7 Number of voluntary quits per 100 employees in the survey group.

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 57, Bulletin 923, U. S. Bureau of Labor Statistics)

Table IIIa Distribution of Orthopedically Impaired Workers by Type of Impairment

Type of impairment	Number of workers	Type of impairment	Number of workers
Total	1,522		
Amputation cases	484	Loss of use cases	761
One hand	183	One hand	114
Two hands	5	Two hands	8
One arm	72	One arm	174
Two arms	2	Two arms	9
One foot	38	One foot	51
Two feet	1	Two feet	19
One leg	176	One leg	335
Two legs	7	Two legs	51
Back deformity cases	214	Multiple cases	63

Table IIIb Number and Distribution of Orthopedic Cases Compared With Other Impaired Workers, by Age

Age group	Number of workers		Percent	
	Orthopedic cases	Other impaired	Orthopedic cases	Other impaired
Total	1,522	9,506	100.0	100.0
Under 20 years	10	69	.7	.7
20 and under 25 years	106	405	6.9	4.3
25 and under 30 years	166	735	10.9	7.7
30 and under 35 years	226	891	14.9	9.4
35 and under 40 years	211	973	13.8	10.2
40 and under 45 years	164	1,074	10.8	11.3
45 and under 50 years	178	1,134	11.7	11.9
50 and under 55 years	189	1,373	12.4	14.4
55 and under 60 years	139	1,404	9.2	14.8
60 and under 65 years	94	994	6.1	10.5
65 years and over	39	454	2.6	4.8

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 88, Bulletin 923, U. S. Bureau of Labor Statistic)

Table IV WORK PERFORMANCE OF EX-TUBERCULOUS CASES AND OF MATCHED UNIMPAIRED WORKERS

Factor	Number of workers		Average performance	
	Impaired	Unimpaired	Impaired	Unimpaired
Absenteeism				
Frequency rate 1	513	910	3.7	3.5
Nondisabling injury				
Frequency rate 2	507	902	13.2	14.2
Disabling injury:				
Frequency rate 3	512	909	5.9	10.3
Time-lost rate 4	512	909	.05	.09
Days disabled 5	---	---	11.7	11.4
Output relative 6	(7)	(7)	(7)	(7)
Quit rate 8	200	383	.8	2.6

Notes:
1 Number of days lost per 100 scheduled workdays.
2 Number of injuries per 10,000 exposure-hours.
3 Number of injuries per 1,000,000 exposure-hours.
4 Number of days lost for disabling injury per 100 scheduled workdays.
5 Number of days of disability per disabling injury.
6 Percentage relationship of production efficiency of impaired to that of matched unimpaired workers.
7 Data available for too few cases to permit showing performance figures.
8 Number of voluntary quits per 100 employees in the survey group.

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 97, Bulletin 922, U. S. Bureau of Labor Statistics)

Table IVa Number and Percentage Distribution of Ex-tuberculous Cases Compared With Other Impaired Workers Studied, by Age Group

Age group	Number of workers		Percent	
	Ex-tuber-culous	Other impaired	Ex-tuber-culous	Other impaired
Total	513	10,515	100.0	100.0
Under 20 years	2	77	.4	.7
20 and under 25 years	14	497	2.7	4.7
25 and under 30 years	40	861	7.8	8.2
30 and under 35 years	65	1,052	12.7	10.0
35 and under 40 years	65	1,119	12.7	10.7
40 and under 45 years	98	1,140	19.1	10.8
45 and under 50 years	72	1,240	14.0	11.8
50 and under 55 years	76	1,486	14.8	14.1
55 and under 60 years	52	1,491	10.1	14.2
60 and under 65 years	24	1,064	4.7	10.1
65 years and over	5	488	1.0	4.7

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 27, Bulletin 928, U. S. Bureau of Labor Statistics)

Table V WORK PERFORMANCE OF PEPTIC ULCER CASES AS OF MATCHED UNIMPAIRED WORKERS

Factor	Number of workers		Average performance	
	Impaired	Unimpaired	Impaired	Unimpaired
Absenteeism				
Frequency rate 1	428	806	5.4	2.9
Nondisabling injury				
Frequency rate 2	424	799	11.0	11.1
Disabling injury:				
Frequency rate 3	428	806	10.7	8.7
Time-Lost rate 4	428	806	.10	.12
Days disabled 5	---	---	11.6	18.0
Output relative 6	(7)	(7)	(7)	(7)
Quit rate 8	195	357	4.6	2.0

Notes:
1 Number of days lost per 100 scheduled workdays.
2 Number of injuries per 10,000 exposure-hours.
3 Number of injuries per 1,000,000 exposure-hours.
4 Number of days lost for disabling injury per 100 scheduled workdays.
5 Number of days disability per disabling injury.
6 Percentage relationship of production efficiency of impaired to that of matched unimpaired.
7 Data available for too few cases to permit showing performance figures.
8 Number of voluntary quits per 100 employees in the survey group.

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 104. Bulletin 983, U. S. Bureau of Labor Statistics)

Table Va Number and Percentage Distribution of Peptic Ulcer Cases Compared With Other Impaired Workers Studied, by Age Group

Age group	Number of workers		Percent	
	Peptic ulcer cases	Other Impaired	Peptic ulcer cases	Other Impaired
Total	428	10,600	100.0	100.0
Under 20 years	0	79	.0	.7
20 and under 25 years	21	490	4.9	4.6
25 and under 30 years	55	846	12.9	8.0
30 and under 35 years	54	1,065	12.6	10.0
35 and under 40 years	68	1,110	15.9	10.5
40 and under 45 years	57	1,181	13.3	11.1
45 and under 50 years	54	1,258	12.6	11.9
50 and under 55 years	59	1,503	13.8	14.2
55 and under 60 years	34	1,509	7.9	14.3
60 and under 65 years	23	1,065	5.4	10.1
65 years and over	3	490	.7	4.6

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 104, Bulletin 923, U. S. Bureau of Labor Statistics)

Table VI COMPARISON BETWEEN WORKERS WITH HERNIAS AND MATCHED UNIMPAIRED WORKERS

Factor	Number of workers		Average performance	
	Impaired	Unimpaired	Impaired	Unimpaired
Absenteeism				
Frequency rate 1	3,544	5,869	3.2	3.1
Nondisabling injury				
Frequency rate 2	3,501	5,806	9.2	9.1
Disabling injury				
Frequency rate 3	3,543	5,868	0.9	0.9
Time-lost rate 4	3,543	5,868	.12	.11
Days disabled 5	---	---	14.8	14.4
Output relative 6	226	365	101.5	100.0
Quit rate 7	1,803	3,068	2.9	1.8

Notes:
1 Number of days lost per 100 scheduled workdays.
2 Number of injuries per 10,000 exposure-hours.
3 Number of injuries per 1,000,000 exposure-hours.
4 Number of days lost for disabling injury per 100 scheduled workdays.
5 Number of days of disability per disabling injury.
6 Percentage relationship of production efficiency of impaired to that of matched unimpaired.
7 Number of voluntary quits per 100 employees in the survey group.

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 22. Bulletin 923, U. S. Bureau of Labor Statistics)

Table VIa Number and Percentage Distribution of Hernia Cases Compared With Other Impaired Workers, by Age Group

Age group	Number of workers		Percent	
	Hernia cases	Other impaired	Hernia cases	Other impaired
Total	3,544	7,464	100.0	100.0
Under 20 years	8	71	.2	.9
20 and under 25 years	64	447	1.8	6.0
25 and under 30 years	146	755	4.1	10.1
30 and under 35 years	264	863	7.4	11.4
35 and under 40 years	372	812	10.5	10.8
40 and under 45 years	408	830	11.5	11.1
45 and under 50 years	460	852	13.0	11.4
50 and under 55 years	608	954	17.3	12.8
55 and under 60 years	602	941	17.0	12.6
60 and under 65 years	419	669	11.8	8.9
65 years and over	193	300	5.4	4.0

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 23, Bulletin 923, U. S. Bureau of Labor Statistics)

Table VII WORK PERFORMANCE OF WORKERS WITH MULTIPLE IMPAIRMENTS AND OF MATCHED UNIMPAIRED WORKERS

Factor	Number of workers		Average performance	
	Impaired	Unimpaired	Impaired	Unimpaired
Absenteeism				
Frequency rate 1	587	919	4.3	3.3
Nondisabling injury				
Frequency rate 2	583	915	10.0	11.4
Disabling injury:				
Frequency 3	586	918	7.3	9.4
Time-lost rate 4	586	918	.14	.18
Days disabled 5	---	---	24.8	20.2
Output relative 6	(7)	(7)	(7)	(7)
Quit rate 8	520	831	1.5	2.8

Notes:
1 Number of days lost per 100 scheduled workdays.
2 Number of injuries per 10,000 exposure-hours.
3 Number of injuries per 1,000,000 exposure-hours.
4 Number of days lost for disabling injury per 100 scheduled workdays.
5 Number of days of disability per disabling injury.
6 Percentage relationship of production efficiency of impaired to that of matched unimpaired.
7 Data available for too few cases to permit showing performance data.
8 Number of voluntary quits per 100 employees in the survey group.

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 64. Bulletin 928, U. S. Bureau of Labor Statistics)

Table VIIa Number of Impaired Workers, by Type of Multiple Impairment

Type of Impairment	Number of Workers	Type of Impairment	Number of Workers
Total	587		
		Hearing-Hernia	27
Orthopedic-Vision	28	Hearing-Cardiac	13
Orthopedic-Hearing	11	Hearing-Ex-T.B.	3
Orthopedic-Hernia	75	Hearing-Ulcer	5
Orthopedic-Cardiac	21	Hernia-Cardiac	120
Orthopedic-Ex-T.B.	9	Hernia-Ex-T.B.	29
Orthopedic-Ulcer	5	Hernia-Ulcer	18
Orthopedic-Diabetic	3	Hernia-Diabetic	9
Vision-Hearing	16	Hernia-Epileptic	2
Vision-Hernia	78	Cardiac-Ex-T.B.	22
Vision-Cardiac	52	Cardiac-Ulcer	9
Vision-Ex-T.B.	12	Cardiac-Diabetic	4
Vision-Ulcer	8	Cardiac-Epileptic	1
Vision-Diabetic	4	Ex-T.B.-Ulcer	2
Vision-Epileptic	1	Ulcer-Diabetic	2

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 84, Bulletin 923, Dept. of Labor.

Table VIIb Number and Percentage Distribution of Multiple Impairment Cases Compared With Other Impaired Workers Studied, by Age Group

Age Group	Number of workers		Percent	
	Multiple cases	Other impaired	Multiple cases	Other impaired
Total	587	10,441	100.0	100.0
Under 20 years	1	78	.2	.8
20 and under 25 years	10	501	1.7	4.8
25 and under 30 years	33	868	5.6	8.3
30 and under 35 years	42	1075	7.2	10.3
35 and under 40 years	46	1,138	7.8	10.9
40 and under 45 years	45	1,193	7.7	11.4
45 and under 50 years	61	1,251	10.3	12.0
50 and under 55 years	88	1,474	15.0	14.1
55 and under 60 years	121	1,422	20.6	13.6
60 years and over	140	1,441	23.9	13.8

(From The Performance of Physically Impaired Workers in Manufacturing Industries, p. 85, Bulletin 923, Dept. of Labor.

APPENDIX B

Table VIII ESTIMATED RETIRED OFFICERS LIST*
AS OF 1 JANUARY 1949

	Total	USN	USMR
Grand Total	14,152	10,841	3,311
Physical Disability	7,938	4,701	3,237
Voluntary	1,794	1,740	54
Involuntary	625	625	-0-
Statutory Age	242	222	20
Public Law 305†	3,553	3,553	-0-

Notes:
*Excludes retired officers on active duty: USN 93; USMR 2; and Honorary Retired.

†Former enlisted men advanced to the highest rank held in World War II.

(Condensed from data compiled by the Bureau of Naval Personnel, Pers-25, Navy Department, Washington, D. C.)

Table IX NAVY WARRANT OFFICERS RETIRED FOR DISABILITY (INACTIVE)-BY RANK
AS OF 1 JANUARY 1949

	Total	Adm.	Comm.	Capt.	Cdr.	LtCdr.	Lieut.	Lt(jg)	Ens.	C.W.O.	W.O.
Male Officers	7,349	229	27	844	936	1,441	1,629	957	391	663	283
USN-Line	3,337	192	22	447	433	486	576	294	107	541	239
USN-Staff Corps	1,034	36	2	272	172	220	232	74	16		1
USNR-Line	2,226		1	73	134	489	667	495	237	63	17
USNR-StaffCorps	792		2	52	147	237	154	94	31	59	26
Waves-USNR	73					4	27	29	13		
Nurses*	476										
Grand Total	7,938	229	27	844	936	1,445	1,656	986	394	663	283

* No rank breakdown.

(From data compiled by Bureau of Naval Personnel, Pers 252,
Navy Department, Washington, D. C.)

Table X U. S. NAVY AND U. S. NAVAL RESERVE OFFICERS RETIRED FOR DISABILITY
PERIOD 1 OCTOBER 1945 TO 1 NOVEMBER 1947

	Total	Adm	V.Adm	R.Adm	Comd	Capt	Cdr	LtCdr	Lieut	Ltjg	Ens	CWO	WO
Diseases of the Circulatory System	1,007	2	8	30	15	223	170	203	156	62	15	103	16
Diseases of Mind	460			1		31	37	72	115	95	51	34	24
Arthritis	301	1	3	6	6	52	37	66	54	29	9	34	5
Herniated Discs	32					1	7	7	12			3	2
Tuberculousis	431		1	2		11	28	60	116	107	42	54	10
Diseases of the Respiratory System	86			2		6	10	17	18	15	1	15	2
Tumors	91			1	1	11	10	23	17	19	3	4	2
Deformity Acquired	367			4		24	21	64	114	82	21	31	6
Amputations	116					2	5	13	30	39	11	4	3
Diseases of the Digestive System	382	2		4	6	53	42	70	96	54	21	37	7
Disease of the Nervous System	240		1		2	28	13	45	55	40	10	25	8
Diseases of Ear	133				3	19	17	30	30	17	2	11	4
Diseases of Eye	146	1	1		1	11	7	36	39	25	9	11	5
Total	3,792	6	14	50	32	472	404	706	851	654	203	376	94

(Condensed from data compiled by Bureau of Naval Personnel, Navy Department)

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE 2-10-49

NAVAL JOB TITLE [illegible] Large Carrier SCHEDULE NO. 61 81

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	40% in office
+	2 OUTSIDE	60% flight quarters
−	3 EXCESSIVE HEAT	
−	4 EXCESSIVE HUMIDITY	
✓	5 EXCESSIVE COLD	Exposed to weather
✓	6 EXCESSIVE DAMPNESS OR CHILLING	Exposed to weather
−	7 DRY ATMOSPHERIC CONDITIONS	
✓	8 EXCESSIVE NOISE INTERMITTENT	Aircraft engines
−	9 CONSTANT NOISE	
−	10 DUST	
−	11 ASBESTOS, SILICA, ETC.	
−	12 SMOKE, FUMES OR GASES	
−	13 SOLVENTS	
−	14 GREASES AND OILS	
−	15 RADIANT ENERGY	
−	16 ELECTRICAL ENERGY	
−	17 SLIPPERY OR UNEVEN WALKING SURFACES	
−	18 MOVING OBJECTS OR VEHICLES	
−	19 WORKING ARDUND MACH. WITH MOVING PARTS	
−	20 WORKING ON LADDERS AND SCAFFOLDING	
+	21 HIGH PLACES	Flight control bridge
−	22 WORKING BELOW GROUND	
−	23 EXPLOSIVES	
−	24 VIBRATION	
−	25 WORKING CLOSELY WITH OTHERS	
−	26 WORKS ALONE	
✓	27 PROTRACTED OR IRREGULAR HOURS OF WORK	During flight operation
−	28 UNUSUAL FATIGUE FACTORS *(Specify)*	
−	29 SPECIAL CLIMATE FACTORS *(Specify)*	

	FUNCTIONAL FACTORS	REMARKS
−	30 HEAVY LIFTING 45-100 LBS.	
−	31 MODERATE LIFTING 15-45 LBS.	
−	32 LIGHT LIFTING UNDER 15 LBS.	
−	33 HEAVY CARRYING 45-100 LBS.	
−	34 MODERATE CARRYING 15-45 LBS.	
−	35 LIGHT CARRYING UNDER 15 LBS.	
−	36 WALKING	
✓	37 STANDING	During flight operatio
−	38 CRAWLING	
−	39 KNEELING	
−	40 PULLING-STRAIGHT	
−	41 PULLING-HAND OVER HAND	
−	42 PUSHING	
−	43 REACHING ABOVE SHOULDER	
−	44 USE OF FINGERS	
−	45 BOTH HANDS REQUIRED	
−	46 REPEATED BENDING	
−	47 CLIMBING, LEGS ONLY	
−	48 CLIMBING, USE OF LEGS AND ARMS	
−	49 BOTH LEGS REQUIRED	
−	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
−	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
−	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
+	53 SPECIFIC VISUAL REQUIREMENTS	Normal acuity
−	54 BOTH EYES REQUIRED	
−	55 DEPTH PERCEPTION	
−	56 ABILITY TO DISTINGUISH BASIC COLORS	
−	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
+	58 HEARING REQUIREMENTS *(Specify)*	Normal

ADDITIONAL COMMENTS

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE 6-Jly-48

NAVAL JOB TITLE Aircraft Ordnance Officer [illegible] carrier SCHEDULE NO. CV-XO

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	Magazines
+	2 OUTSIDE	Hangar deck
–	3 EXCESSIVE HEAT	
–	4 EXCESSIVE HUMIDITY	
–	5 EXCESSIVE COLD	
–	6 EXCESSIVE DAMPNESS OR CHILLING	
–	7 DRY ATMOSPHERIC CONDITIONS	
–	8 EXCESSIVE NOISE INTERMITTENT	
✓	9 CONSTANT NOISE	Aircraft engines
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
✓	12 SMOKE, FUMES OR GASES	Aircraft exhaust
–	13 SOLVENTS	
–	14 GREASES AND OILS	
–	15 RADIANT ENERGY	
–	16 ELECTRICAL ENERGY	
–	17 SLIPPERY OR UNEVEN WALKING SURFACES	
✓	18 MOVING OBJECTS OR VEHICLES	Aircraft & automotive gear
–	19 WORKING AROUND MACH. WITH MOVING PARTS	
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
–	23 EXPLOSIVES	Ordnance material
–	24 [illegible]	
–	25 WORKING CLOSELY WITH OTHERS	
–	26 WORKS ALONE	
✓	27 PROTRACTED OR IRREGULAR HOURS OF WORK	Flight & general quarters
✓	28 INDUSTRIAL HAZARD FACTORS (Specify)	Noise
–	29 SPECIAL HAZARD FACTORS (Specify)	

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
+	31 MODERATE LIFTING 15-45 LBS.	Machine guns
+	32 LIGHT LIFTING UNDER 15 LBS.	Ammunition
–	33 HEAVY CARRYING 45-100 LBS.	
+	34 MODERATE CARRYING 15-45 LBS.	Ammunition
–	35 LIGHT CARRYING UNDER 15 LBS.	
–	36 WALKING	
–	37 STANDING	
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
✓	42 PUSHING	Aircraft
–	43 REACHING ABOVE SHOULDER	
–	44 USE OF FINGERS	
–	45 BOTH HANDS REQUIRED	
–	46 REPEATED BENDING	
–	47 CLIMBING, LEGS ONLY	
–	48 CLIMBING, USE OF LEGS AND ARMS	
–	49 BOTH LEGS REQUIRED	
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
–	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
–	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
+	53 SPECIFIC VISUAL REQUIREMENTS	Normal
–	54 BOTH EYES REQUIRED	
–	55 DEPTH PERCEPTION	
–	56 ABILITY TO DISTINGUISH BASIC COLORS	
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
+	58 HEARING REQUIREMENTS (Specify)	Normal

ADDITIONAL COMMENT

B-2345

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE 2-14-40

NAVAL JOB TITLE Catapult & Arresting Gear Officer Junior SCHEDULE NO. CV-62

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	Administrative work
+	2 OUTSIDE	During flight operation
✓	3 EXCESSIVE HEAT	Depending on area
✓	4 EXCESSIVE HUMIDITY	Depending on area
✓	5 EXCESSIVE COLD	Depending on area
✓	6 EXCESSIVE DAMPNESS OR CHILLING	Depending on area
–	7 DRY ATMOSPHERIC CONDITIONS	
✓	8 EXCESSIVE NOISE INTERMITTENT	During flight operation
–	9 CONSTANT NOISE	
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
–	12 SMOKE, FUMES OR GASES	
–	13 SOLVENTS	
–	14 GREASES AND OILS	
–	15 RADIANT ENERGY	
–	16 ELECTRICAL ENERGY	
✓	17 SLIPPERY OR UNEVEN WALKING SURFACES	Flight deck slippery
+	18 MOVING OBJECTS OR VEHICLES	Taxing planes
+	19 WORKING AROUND MACH. WITH MOVING PARTS	Catapult & arresting gear
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
–	23 EXPLOSIVES	
✓	24 VIBRATION	When ship is uderway
+	25 WORKING CLOSELY WITH OTHERS	In a supervisory capacity
–	26 WORKS ALONE	
–	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
–	28 UNUSUAL FATIGUE FACTORS *(Specify)*	
✓	29 SPECIAL CLIMATE FACTORS *(Specify)*	Depending on geographic location of ship

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
–	31 MODERATE LIFTING 15-45 LBS.	
–	32 LIGHT LIFTING UNDER 15 LBS.	
–	33 HEAVY CARRYING 45-100 LBS.	
–	34 MODERATE CARRYING 15-45 LBS.	
–	35 LIGHT CARRYING UNDER 15 LBS.	
✓	36 WALKING	During flight quarters
✓	37 STANDING	During flight quarters
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
–	42 PUSHING	
–	43 REACHING ABOVE SHOULDER	
–	44 USE OF FINGERS	
+	45 BOTH HANDS REQUIRED	For hand signals
–	46 REPEATED BENDING	
–	47 CLIMBING, LEGS ONLY	
+	48 CLIMBING, USE OF LEGS AND ARMS	Climbing up & down ladders about the ship
–	49 BOTH LEGS REQUIRED	
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
–	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
–	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
–	53 SPECIFIC VISUAL REQUIREMENTS	
+	54 BOTH EYES REQUIRED	Safety factor to avoid accidents
–	55 DEPTH PERCEPTION	
+	56 ABILITY TO DISTINGUISH BASIC COLORS	Reading hydraulic line charts
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
+	58 HEARING REQUIREMENTS *(Specify)*	Normal

ADDITIONAL COMMENTS

8-2345

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS 2499 (NEW 2-48)

DATE 2-16-49

NAVAL JOB TITLE Hangar Deck Officer Large Carrier SCHEDULE NO. CV-79

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	Hangar deck
–	2 OUTSIDE	
–	3 EXCESSIVE HEAT	
–	4 EXCESSIVE HUMIDITY	
–	5 EXCESSIVE COLD	
–	6 EXCESSIVE DAMPNESS OR CHILLING	
–	7 DRY ATMOSPHERIC CONDITIONS	
✓	8 EXCESSIVE NOISE INTERMITTENT	Engines
–	9 CONSTANT NOISE	
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
✓	12 SMOKE, FUMES OR GASES	Aircraft engines
–	13 SOLVENTS	
✓	14 GREASES AND OILS	Around aircraft
–	15 RADIANT ENERGY	
✓	16 ELECTRICAL ENERGY	Operation of elevators & hoist
✓	17 SLIPPERY OR UNEVEN WALKING SURFACES	Hangar deck
✓	18 MOVING OBJECTS OR VEHICLES	Moving planes & tractors
–	19 WORKING AROUND MACH. WITH MOVING PARTS	
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
✓	23 EXPLOSIVES	Working around planes
✓	24 VIBRATION	Ship underway
+	25 WORKING CLOSELY WITH OTHERS	Supervision
–	26 WORKS ALONE	
✓	27 PROTRACTED OR IRREGULAR HOURS OF WORK	Flight operations
–	28 UNUSUAL FATIGUE FACTORS (Specify)	
✓	29 UNUSUAL ENVIRONMENTAL CONDITIONS (Specify)	Geographic area of ship

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
–	31 MODERATE LIFTING 15-45 LBS.	
–	32 LIGHT LIFTING UNDER 15 LBS.	
–	33 HEAVY CARRYING 45-100 LBS.	
–	34 MODERATE CARRYING 15-45 LBS.	
–	35 LIGHT CARRYING UNDER 15 LBS.	
✓	36 WALKING	Hangar deck
✓	37 STANDING	Hangar deck
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
–	42 PUSHING	
–	43 REACHING ABOVE SHOULDER	
–	44 USE OF FINGERS	
+	45 BOTH HANDS REQUIRED	Aircraft
–	46 REPEATED BENDING	
–	47 CLIMBING, LEGS ONLY	
✓	48 CLIMBING, USE OF LEGS AND ARMS	Aircraft
✓	49 BOTH LEGS REQUIRED	
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
–	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
–	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
–	53 SPECIFIC VISUAL REQUIREMENTS	
✓	54 BOTH EYES REQUIRED	Safety
✓	55 DEPTH PERCEPTION	Normal
✓	56 ABILITY TO DISTINGUISH BASIC COLORS	Damage control charts
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
✓	58 HEARING REQUIREMENTS (Specify)	Normal

USA (EM ENT.)

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS 2499 (NEW 2-48)

DATE 2-[illegible]-49

NAVAL JOB TITLE V-2 Division Officer (Aircraft Maintenance) SCHEDULE NO. CV-40

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	Office & hangar deck
–	2 OUTSIDE	
–	3 EXCESSIVE HEAT	
–	4 EXCESSIVE HUMIDITY	
–	5 EXCESSIVE COLD	
–	6 EXCESSIVE DAMPNESS OR CHILLING	
–	7 DRY ATMOSPHERIC CONDITIONS	
✓	8 EXCESSIVE NOISE INTERMITTENT	Turned-up aircraft
–	9 CONSTANT NOISE	
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
–	12 SMOKE, FUMES OR GASES	
–	13 SOLVENTS	
–	14 GREASES AND OILS	
–	15 RADIANT ENERGY	
–	16 ELECTRICAL ENERGY	
–	17 SLIPPERY OR UNEVEN WALKING SURFACES	
–	18 MOVING OBJECTS OR VEHICLES	
+	19 WORKING AROUND MACH. WITH MOVING PARTS	Supervising maint. work around turning props
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
–	23 EXPLOSIVES	
–	24 VIBRATION	
–	25 WORKING CLOSELY WITH OTHERS	
–	26 WORKS ALONE	
–	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
–	28 UNUSUAL FATIGUE FACTORS (Specify)	
–	29 SPECIAL CLIMATE FACTORS (Specify)	

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
–	31 MODERATE LIFTING 15-45 LBS.	
–	32 LIGHT LIFTING UNDER 15 LBS.	
–	33 HEAVY CARRYING 45-100 LBS.	
–	34 MODERATE CARRYING 15-45 LBS.	
–	35 LIGHT CARRYING UNDER 15 LBS.	
–	36 WALKING	
–	37 STANDING	
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
–	42 PUSHING	
–	43 REACHING ABOVE SHOULDER	
–	44 USE OF FINGERS	
+	45 BOTH HANDS REQUIRED	Climbing in & out of planes
–	46 REPEATED BENDING	
–	47 CLIMBING, LEGS ONLY	
+	48 CLIMBING, USE OF LEGS AND ARMS	Climbing in-out of planes
–	49 BOTH LEGS REQUIRED	
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
–	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
–	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
–	53 SPECIFIC VISUAL REQUIREMENTS	
+	54 BOTH EYES REQUIRED	For safety reasons
–	55 DEPTH PERCEPTION	
–	56 ABILITY TO DISTINGUISH BASIC COLORS	
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
–	58 HEARING REQUIREMENTS (Specify)	

ADDITIONAL COMMENTS

B-2345

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS 2499 (NEW 2-48)

DATE 2-9-49

NAVAL JOB TITLE [illegible] SCHEDULE NO. [illegible]

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	
+	2 OUTSIDE	
–	3 EXCESSIVE HEAT	
–	4 EXCESSIVE HUMIDITY	
–	5 EXCESSIVE COLD	
–	6 EXCESSIVE DAMPNESS OR CHILLING	
–	7 DRY ATMOSPHERIC CONDITIONS	
–	8 EXCESSIVE NOISE INTERMITTENT	
✓	9 CONSTANT NOISE	Aircraft engines during warm-up
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
✓	12 SMOKE, FUMES OR GASES	Gas fumes & engine exhaust fumes
–	13 SOLVENTS	
–	14 GREASES AND OILS	
–	15 RADIANT ENERGY	
–	16 ELECTRICAL ENERGY	
–	17 SLIPPERY OR UNEVEN WALKING SURFACES	
–	18 MOVING OBJECTS OR VEHICLES	
✓	19 WORKING AROUND MACH. WITH MOVING PARTS	Gas pumps & elevators
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
+	23 EXPLOSIVES	Bombs, torpedoes, and ammunition
–	24 VIBRATION	
+	25 WORKING CLOSELY WITH OTHERS	Division personnel
+	26 ALONE	Supervisor
✓	27 PROTRACTED OR IRREGULAR HOURS OF WORK	General quarters and watch duties
–	28 UNUSUAL FATIGUE FACTORS (Specify)	
–	29 SPECIAL CLIMATE FACTORS (Specify)	

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
–	31 MODERATE LIFTING 15-45 LBS.	
–	32 LIGHT LIFTING UNDER 15 LBS.	
–	33 HEAVY CARRYING 45-100 LBS.	
–	34 MODERATE CARRYING 15-45 LBS.	
–	35 LIGHT CARRYING UNDER 15 LBS.	
✓	36 WALKING	
✓	37 STANDING	
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
–	42 PUSHING	
–	43 REACHING ABOVE SHOULDER	
✓	44 USE OF FINGERS	
✓	45 BOTH HANDS REQUIRED	
–	46 REPEATED BENDING	
–	47 CLIMBING, LEGS ONLY	
✓	48 CLIMBING, USE OF LEGS AND ARMS	
–	49 BOTH LEGS REQUIRED	
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
✓	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
–	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
–	53 SPECIFIC VISUAL REQUIREMENTS	
✓	54 BOTH EYES REQUIRED	Normal vision
–	55 DEPTH PERCEPTION	
–	56 ABILITY TO DISTINGUISH BASIC COLORS	
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
✓	58 HEARING REQUIREMENTS (Specify)	Normal hearing

ADDITIONAL COMMENTS:

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE

NAVAL JOB TITLE Corrections Officer, Disciplinary Barracks SCHEDULE NO. 7103-6

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	60% in office
+	2 OUTSIDE	
—	3 EXCESSIVE HEAT	
—	4 EXCESSIVE HUMIDITY	
—	5 EXCESSIVE COLD	
—	6 EXCESSIVE DAMPNESS OR CHILLING	
—	7 DRY ATMOSPHERIC CONDITIONS	
—	8 EXCESSIVE NOISE INTERMITTENT	
—	9 CONSTANT NOISE	
—	10 DUST	
—	11 ASBESTOS, SILICA, ETC.	
—	12 SMOKE, FUMES OR GASES	
—	13 SOLVENTS	
—	14 GREASES AND OILS	
—	15 RADIANT ENERGY	
—	16 ELECTRICAL ENERGY	
—	17 SLIPPERY OR UNEVEN WALKING SURFACES	
—	18 MOVING OBJECTS OR VEHICLES	
—	19 WORKING AROUND MACH. WITH MOVING PARTS	
—	20 WORKING ON LADDERS AND SCAFFOLDING	
—	21 HIGH PLACES	
—	22 WORKING BELOW GROUND	
—	23 EXPLOSIVES	
—	24 VIBRATION	
—	25 WORKING CLOSELY WITH OTHERS	
—	26 WORKS ALONE	
—	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
—	28 UNUSUAL FATIGUE FACTORS (Specify)	
—	29 SPECIAL CLIMATE FACTORS (Specify)	

	FUNCTIONAL FACTORS	REMARKS
—	30 HEAVY LIFTING 45-100 LBS.	
—	31 MODERATE LIFTING 15-45 LBS.	
—	32 LIGHT LIFTING UNDER 15 LBS.	
—	33 HEAVY CARRYING 45-100 LBS.	
—	34 MODERATE CARRYING 15-45 LBS.	
—	35 LIGHT CARRYING UNDER 15 LBS.	
+	36 WALKING	Active to inspect
—	37 STANDING	
—	38 CRAWLING	
—	39 KNEELING	
—	40 PULLING-STRAIGHT	
—	41 PULLING-HAND OVER HAND	
—	42 PUSHING	
—	43 REACHING ABOVE SHOULDER	
—	44 USE OF FINGERS	
—	45 BOTH HANDS REQUIRED	
—	46 REPEATED BENDING	
—	47 CLIMBING, LEGS ONLY	
—	48 CLIMBING, USE OF LEGS AND ARMS	
—	49 BOTH LEGS REQUIRED	
—	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
—	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
—	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
+	53 SPECIFIC VISUAL REQUIREMENTS	Capable of reading small print
—	54 BOTH EYES REQUIRED	
—	55 DEPTH PERCEPTION	
—	56 ABILITY TO DISTINGUISH BASIC COLORS	
—	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
+	58 HEARING REQUIREMENTS (Specify)	Ability to hear spoken voice

ADDITIONAL COMMENTS

Duties of this billet are performed under conditions of close confinement, within area enclosed by high wall, behind locked and guarded gates.

8-2345

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE

NAVAL JOB TITLE Training Officer

SCHEDULE NO. NJOS-49

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	75% of time in shops & class
+	2 OUTSIDE	25% procuring material
−	3 EXCESSIVE HEAT	
−	4 EXCESSIVE HUMIDITY	
−	5 EXCESSIVE COLD	
−	6 EXCESSIVE DAMPNESS OR CHILLING	
−	7 DRY ATMOSPHERIC CONDITIONS	
−	8 EXCESSIVE NOISE INTERMITTENT	
−	9 CONSTANT NOISE	
−	10 DUST	
−	11 ASBESTOS, SILICA, ETC.	
−	12 SMOKE, FUMES OR GASES	
−	13 SOLVENTS	
−	14 GREASES AND OILS	
−	15 RADIANT ENERGY	
−	16 ELECTRICAL ENERGY	
−	17 SLIPPERY OR UNEVEN WALKING SURFACES	
−	18 MOVING OBJECTS OR VEHICLES	
−	19 WORKING AROUND MACH. WITH MOVING PARTS	
−	20 WORKING ON LADDERS AND SCAFFOLDING	
−	21 HIGH PLACES	
−	22 WORKING BELOW GROUND	
−	23 EXPLOSIVES	
−	24 [illegible]	
+	25 WORKING CLOSELY WITH OTHERS	Directs instruction staff
−	26 WORKS ALONE	
−	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
−	28 UNUSUAL FATIGUE FACTORS (Specify)	
−	29 ORAL MAGE FACTORS (Specify)	

	FUNCTIONAL FACTORS	REMARKS
−	30 HEAVY LIFTING 45-100 LBS.	
−	31 MODERATE LIFTING 15-45 LBS.	
−	32 LIGHT LIFTING UNDER 15 LBS.	
−	33 HEAVY CARRYING 45-100 LBS.	
−	34 MODERATE CARRYING 15-45 LBS.	
−	35 LIGHT CARRYING UNDER 15 LBS.	
+	36 WALKING	Conducts inspections
−	37 STANDING	
−	38 CRAWLING	
−	39 KNEELING	
−	40 PULLING-STRAIGHT	
−	41 PULLING-HAND OVER HAND	
−	42 PUSHING	
−	43 REACHING ABOVE SHOULDER	
+	44 USE OF FINGERS	Needed for writing
−	45 BOTH HANDS REQUIRED	
−	46 REPEATED BENDING	
−	47 CLIMBING, LEGS ONLY	
−	48 CLIMBING, USE OF LEGS AND ARMS	
−	49 BOTH LEGS REQUIRED	
−	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
−	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
−	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
✓	53 SPECIFIC VISUAL REQUIREMENTS	Normal for office work
−	54 BOTH EYES REQUIRED	
−	55 DEPTH PERCEPTION	
−	56 ABILITY TO DISTINGUISH BASIC COLORS	
−	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
✓	58 HEARING REQUIREMENTS (Specify)	Normal for office work

ADDITIONAL COMMENTS

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE

NAVAL JOB TITLE Prisoner Personnel Officer

SCHEDULE NO. MOS-5

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	70% in office
+	2 OUTSIDE	30% inspections
–	3 EXCESSIVE HEAT	
–	4 EXCESSIVE HUMIDITY	
–	5 EXCESSIVE COLD	
–	6 EXCESSIVE DAMPNESS OR CHILLING	
–	7 DRY ATMOSPHERIC CONDITIONS	
–	8 EXCESSIVE NOISE INTERMITTENT	
–	9 CONSTANT NOISE	
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
–	12 SMOKE, FUMES OR GASES	
–	13 SOLVENTS	
–	14 GREASES AND OILS	
–	15 RADIANT ENERGY	
–	16 ELECTRICAL ENERGY	
–	17 SLIPPERY OR UNEVEN WALKING SURFACES	
–	18 MOVING OBJECTS OR VEHICLES	
–	19 WORKING AROUND MACH. WITH MOVING PARTS	
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
–	23 EXPLOSIVES	
–	24 VIBRATION	
+	25 WORKING CLOSELY WITH OTHERS	Supervises 8-10 Office workers
–	26 WORKS ALONE	
+	27 PROTRACTED OR IRREGULAR HOURS OF WORK	Heavy workload Frequent overtime
–	28 UNUSUAL FATIGUE FACTORS *(Specify)*	
–	29 SPECIAL CLIMATE FACTORS *(Specify)*	

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
–	31 MODERATE LIFTING 15-45 LBS.	
–	32 LIGHT LIFTING UNDER 15 LBS.	
–	33 HEAVY CARRYING 45-100 LBS.	
–	34 MODERATE CARRYING 15-45 LBS.	
–	35 LIGHT CARRYING UNDER 15 LBS.	
+	36 WALKING	Inspection tours
–	37 STANDING	
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
–	42 PUSHING	
–	43 REACHING ABOVE SHOULDER	
+	44 USE OF FINGERS	Writing
–	45 BOTH HANDS REQUIRED	
–	46 REPEATED BENDING	
+	47 CLIMBING, LEGS ONLY	Climbing ladders and catwalks.
+	48 CLIMBING, USE OF LEGS AND ARMS	Climbing ladders and catwalks
–	49 BOTH LEGS REQUIRED	
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
–	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
✓	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	In case of prison break
✓	53 SPECIFIC VISUAL REQUIREMENTS	Normal
–	54 BOTH EYES REQUIRED	
–	55 DEPTH PERCEPTION	
–	56 ABILITY TO DISTINGUISH BASIC COLORS	
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
✓	58 HEARING REQUIREMENTS *(Specify)*	

ADDITIONAL COMMENTS

B-2345

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE

NAVAL JOB TITLE Inspecting Officer

SCHEDULE NO. WGS-8

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	90% in office
✓	2 OUTSIDE	10% Inspecting & observing
–	3 EXCESSIVE HEAT	
–	4 EXCESSIVE HUMIDITY	
–	5 EXCESSIVE COLD	
–	6 EXCESSIVE DAMPNESS OR CHILLING	
–	7 DRY ATMOSPHERIC CONDITIONS	
–	8 EXCESSIVE NOISE INTERMITTENT	
–	9 CONSTANT NOISE	
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
+	12 SMOKE, FUMES OR GASES	Lead fumes, metal fumes from melting, solvents
+	13 SOLVENTS	Cleaning solvents for machine parts
–	14 GREASES AND OILS	
–	15 RADIANT ENERGY	
–	16 ELECTRICAL ENERGY	
✓	17 SLIPPERY OR UNEVEN WALKING SURFACES	Inspection of shops and outside projects
–	18 MOVING OBJECTS OR VEHICLES	
–	19 WORKING AROUND MACH. WITH MOVING PARTS	
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
–	23 EXPLOSIVES	
–	24 VIBRATION	
+	25 WORKING CLOSELY WITH OTHERS	Close supervision of 200 prisoners on projects
–	26 WORKS ALONE	
–	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
–	28 UNUSUAL FATIGUE FACTORS (Specify)	
–	29 MENTAL AND EMOTIONAL FACTORS (Specify)	

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
–	31 MODERATE LIFTING 15-45 LBS.	
+	32 LIGHT LIFTING UNDER 15 LBS.	Handling supplies and equipment
–	33 HEAVY CARRYING 45-100 LBS.	
–	34 MODERATE CARRYING 15-45 LBS.	
+	35 LIGHT CARRYING UNDER 15 LBS.	Handling supplies and equipment
+	36 WALKING	Active to inspect
–	37 STANDING	
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
–	42 PUSHING	
–	43 REACHING ABOVE SHOULDER	
+	44 USE OF FINGERS	Performing machine operation
+	45 BOTH HANDS REQUIRED	Performing machine operation
–	46 REPEATED BENDING	
–	47 CLIMBING, LEGS ONLY	
✓	48 CLIMBING, USE OF LEGS AND ARMS	Inspections, climbing ladders and stairs
–	49 BOTH LEGS REQUIRED	
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
–	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
–	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
✓	53 SPECIFIC VISUAL REQUIREMENTS	Capacity for making machine adjustments
✓	54 BOTH EYES REQUIRED	Close inspection work
–	55 DEPTH PERCEPTION	
✓	56 ABILITY TO DISTINGUISH BASIC COLORS	Recognize pipe marks
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
✓	58 HEARING REQUIREMENTS (Specify)	Ability to hear the spoken voice

ADDITIONAL COMMENTS

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE

NAVAL JOB TITLE [illegible] SCHEDULE NO. [illegible]

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	100% of working time
—	2 OUTSIDE	
—	3 EXCESSIVE HEAT	
—	4 EXCESSIVE HUMIDITY	
—	5 EXCESSIVE COLD	
—	6 EXCESSIVE DAMPNESS OR CHILLING	
—	7 DRY ATMOSPHERIC CONDITIONS	
—	8 EXCESSIVE NOISE INTERMITTENT	
—	9 CONSTANT NOISE	
—	10 DUST	
—	11 ASBESTOS, SILICA, ETC.	
—	12 SMOKE, FUMES OR GASES	
—	13 SOLVENTS	
—	14 GREASES AND OILS	
—	15 RADIANT ENERGY	
—	16 ELECTRICAL ENERGY	
—	17 SLIPPERY OR UNEVEN WALKING SURFACES	
—	18 MOVING OBJECTS OR VEHICLES	
—	19 WORKING AROUND MACH. WITH MOVING PARTS	
—	20 WORKING ON LADDERS AND SCAFFOLDING	
—	21 HIGH PLACES	
—	22 WORKING BELOW GROUND	
—	23 EXPLOSIVES	
—	24 VIBRATION	
+	25 WORKING CLOSELY WITH OTHERS	
—	26 WORKS ALONE	
—	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
—	28 UNUSUAL FATIGUE FACTORS *(Specify)*	
—	29 SPECIAL CLIMATE FACTORS *(Specify)*	

	FUNCTIONAL FACTORS	REMARKS
—	30 HEAVY LIFTING 45-100 LBS.	
—	31 MODERATE LIFTING 15-45 LBS.	
—	32 LIGHT LIFTING UNDER 15 LBS.	
—	33 HEAVY CARRYING 45-100 LBS.	
—	34 MODERATE CARRYING 15-45 LBS.	
—	35 LIGHT CARRYING UNDER 15 LBS.	
+	36 WALKING	Walks extensively in conducting inspection
+	37 STANDING	Stands conducting in inspections
—	38 CRAWLING	
—	39 KNEELING	
—	40 PULLING-STRAIGHT	
—	41 PULLING-HAND OVER HAND	
—	42 PUSHING	
—	43 REACHING ABOVE SHOULDER	
—	44 USE OF FINGERS	
—	45 BOTH HANDS REQUIRED	
—	46 REPEATED BENDING	
—	47 CLIMBING, LEGS ONLY	
—	48 CLIMBING, USE OF LEGS AND ARMS	
—	49 BOTH LEGS REQUIRED	
—	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
—	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
—	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
✓	53 SPECIFIC VISUAL REQUIREMENTS	Normal for office work
—	54 BOTH EYES REQUIRED	
—	55 DEPTH PERCEPTION	
—	56 ABILITY TO DISTINGUISH BASIC COLORS	
—	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
✓	58 HEARING REQUIREMENTS *(Specify)*	Normal for office work

ADDITIONAL COMMENTS

8-2345

NAVAL JOB PHYSICAL REQUIREMENTS

NAVPERS-2499 (NEW 2-48)

DATE

NAVAL JOB TITLE Supply and Disbursing Officer SCHEDULE NO. 1103-03

Ascertain the applicability of each element to the particular naval job under consideration. Enter as remarks only brief and factual amplification of factor checked.

	ENVIRONMENTAL FACTORS	REMARKS
+	1 INSIDE	70% in Disbursing Office
+	2 OUTSIDE	30% inspection & supervision of supply activity
–	3 EXCESSIVE HEAT	
–	4 EXCESSIVE HUMIDITY	
–	5 EXCESSIVE COLD	
–	6 EXCESSIVE DAMPNESS OR CHILLING	
–	7 DRY ATMOSPHERIC CONDITIONS	
–	8 EXCESSIVE NOISE INTERMITTENT	
–	9 CONSTANT NOISE	
–	10 DUST	
–	11 ASBESTOS, SILICA, ETC.	
–	12 SMOKE, FUMES OR GASES	
–	13 SOLVENTS	
–	14 GREASES AND OILS	
–	15 RADIANT ENERGY	
–	16 ELECTRICAL ENERGY	
–	17 SLIPPERY OR UNEVEN WALKING SURFACES	
–	18 MOVING OBJECTS OR VEHICLES	
–	19 WORKING AROUND MACH. WITH MOVING PARTS	
–	20 WORKING ON LADDERS AND SCAFFOLDING	
–	21 HIGH PLACES	
–	22 WORKING BELOW GROUND	
–	23 EXPLOSIVES	
–	24 VIBRATION	
+	25 WORKING CLOSELY WITH OTHERS	Directing supply staff
–	26 WORKS ALONE	
–	27 PROTRACTED OR IRREGULAR HOURS OF WORK	
–	28 UNUSUAL FATIGUE FACTORS *(Specify)*	
–	29 SPECIAL CLIMATE FACTORS *(Specify)*	

	FUNCTIONAL FACTORS	REMARKS
–	30 HEAVY LIFTING 45-100 LBS.	
–	31 MODERATE LIFTING 15-45 LBS.	
–	32 LIGHT LIFTING UNDER 15 LBS.	
–	33 HEAVY CARRYING 45-100 LBS.	
–	34 MODERATE CARRYING 15-45 LBS.	
–	35 LIGHT CARRYING UNDER 15 LBS.	
+	36 WALKING	Walks to and from supply activities
–	37 STANDING	
–	38 CRAWLING	
–	39 KNEELING	
–	40 PULLING-STRAIGHT	
–	41 PULLING-HAND OVER HAND	
–	42 PUSHING	
–	43 REACHING ABOVE SHOULDER	
+	44 USE OF FINGERS	Operates adding machine calculator, typewriter
+	45 BOTH HANDS REQUIRED	-do-
–	46 REPEATED BENDING	
–	47 CLIMBING, LEGS ONLY	
–	48 CLIMBING, USE OF LEGS AND ARMS	
✓	49 BOTH LEGS REQUIRED	Necessary walking
–	50 OPERATION OF CRANE, TRUCK, TUG, TRACTOR OR MOTOR VEHICLE	
–	51 ABILITY FOR RAPID MENTAL AND MUSCULAR COORDINATION	
–	52 ABILITY TO USE AND DESIRABILITY OF USING FIREARMS	
+	53 SPECIFIC VISUAL REQUIREMENTS	Sufficient acuity to do close figure work
–	54 BOTH EYES REQUIRED	
–	55 DEPTH PERCEPTION	
–	56 ABILITY TO DISTINGUISH BASIC COLORS	
–	57 ABILITY TO DISTINGUISH SHADES OF COLOR	
–	58 HEARING REQUIREMENTS *(Specify)*	

ADDITIONAL COMMENT

B-2345

APPENDIX C

APPENDIX C

Naval Job Physical Requirements Form[1]

Instructions

The analyst will ascertain the applicability of each element to the particular billet under consideration. If it is found that the element is a major factor in performing the duties of the job, the analyst will place a plus (+) in the left hand space before the element and will enter an appropriate notation in the right hand space, "Remarks". If the element is of moderate significance, a check (✓) should be used. An element of minor or no significance should be entered with a (-).

The remarks should be brief and confined to factual amplification of the mark (+, ✓, or -). Thus an appropriate remark after checking "Explosives" might be: "Does not handle but works in close proximity." Words such as "Constantly", "frequently", or "seldom" should be avoided. If, in analyzing an administrative position, the element "Inside" is checked, a notation such as "100 percent of time" might be applicable. Similarly, if a job requires the incumbent to lift objects weighing over 45 lbs., the analyst should make every effort to obtain

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[1] Manual of Instructions for Naval Occupational Analysis NavPers 15,803, Bureau of Naval Personnel, 1949, pp. 35-40.

exact information as to how often the lifting operation is performed and state the facts, as, "4 hours out of 8". Whether the object lifted is a bag of nails or a metal bar is not pertinent to the Physical Requirements form: Such details, if pertinent, should be covered in the description of duties on the Naval Job Analysis Schedule (NavPers 2497).

Definitions of Factors

Factors are divided into two groups, "Environmental" and "Functional". Definitions of the factors follow:

ENVIRONMENTAL FACTORS

1. Inside: Indoors, protected from weather by a heated, weatherproof building or ship hull.
2. Outside: Outdoors, unprotected from weather or with slight protection from some elements of weather, such as that provided by unheated shed, canopy, or poop-deck.
3. Excessive Heat: Temperature sufficiently high to cause bodily discomfort or fatigue.
4. Excessive Humidity: Atmosphere with sufficiently high moisture content to cause bodily discomfort or fatigue.
5. Excessive Cold: Temperature sufficiently low to cause bodily discomfort, frostbite, or fatigue.

6. Excessive Dampness or Chilling: Area in which worker is in continuous contact with water, fog, or steam or is exposed to frequent or constant drafts or refrigeration.

7. Dry Atmospheric Conditions: Air Sufficiently reduced in moisture concentration to cause bodily discomfort or fatigue.

8. Excessive Noise, Intermittent: Sound, occuring at various intervals, sufficiently loud, sharp, or shrill to cause thought distraction or possible injury to the sense of hearing.

9. Constant Noise: Sound sufficiently loud, sharp, or shrill to distract or tire worker engaged in performance of duty, such as sounds greater than those made by typewriters or other common office equipment, e.g., hum of dynamos.

10. Dust: Area in which the air is filled with small particles of organic material such as textile dust, flour, wood, leather, or feathers which make the workplace unpleasant or are the source of occupational diseases.

11. Asbestos, Silica, etc.: Area in which the air is filled with small particles of inorganic dust such as silica or asbesto which make the workplace unpleasant or are the source of occupational disease.

12. Smoke, Fumes or Gases: Area in which the air is filled with smoke, fumes, gases, vapors, or mists which cause general or localized disabling conditions as a result of inhalation or action on the skin.

13. Solvents (Degreasing Agents): Liquids used for cutting purposes which may produce malignant effects upon the skin.

14. Greases and Oils: Lubricants and other petroleum products which may cause general or localized disabling conditions upon the skin.

15. Radiant Energy: Substances which are radioactive, such as radium, uranium or thorium, and X-rays, ultra-violet rays or infrared rays which involve the risk of impairment of sight or other disabling conditions.

16. Electrical Energy: Electric wires, cable, transformers, bus bars or other electrical parts and equipment that is uninsulated or unshielded, involving risk of severe or fatal electric shock.

17. Slippery or Uneven Walking Surfaces: Area in which balancing is necessary to maintain body equilibrium when working, standing, or running.

18. Moving Objects or Vehicles: Overhead cranes, hand and motor driven vehicles, falling objects which involve the risk of cuts, bruises, sprains, fractures, loss of parts, impairment of sight or sudden death.

19. Working Around Machinery With Moving Parts: Machines and equipment such as found in machine shop, sawmill or used in various types of construction and repair work which involve the risk of cuts, bruises, sprains, fractures, loss of parts, impairment of sight or sudden death.

20. Working on Ladders and Scaffolding: Carpentry, painting, electrical installation and general maintenance and repair duties performed on ladders, scaffolding and other temporary rigging or structers involving the risk of falls and possible bodily injury.

21. High Places: Elevation of permanent construction above the floor or ground level which may cause dizzy spells and falls from loss of equilibrium.

22. Working Below Ground: Area below the surface of the earth, such as tunnels, underground ammunition depots. Include under this factor, work performed in under water diving, submarines, and below waterline aboard ship.

23. Explosives: Explosive gases, vapors, dusts, solids, liquids and other matter which involve the risk of bodily injury or sudden death.

24. Vibration: Repeated motion, pressure, or shock which produces an oscillating or quivering movement of the body or strain on the muscles, particularly of the legs and arms, such as in gunnery duty, operation of various construction tools and equipment.

25. Working Closely With Others: Cooperation with fellow workers in performing similar or related duties of a job, such as a member of a crew or team; also direct, continuous contact with the public.

26. Works Alone: Independent occupational effort which involves virtually no contact with fellow workers or the public.

27. Protracted or Irregular Hours of Work: Work period of varying number of hours per day, or changing schedule of hours for work.

28. Unusual Fatigue Factors (Specify): List here any condition of climate involved in job which is not covered in environmental factors defined above, such as work performed in areas where there is heavy snow or rain.

29. Special Climate Factors (Specify): Heavy snow or rain.

FUNCTIONAL FACTORS

30-32. Lifting: Raising or lowering an object from one level to another, including upward pulling and pushing.

33-35. Carrying: Transporting an object, usually with hands and arms or on the shoulders and back.

36. Walking: Moving about on the feet, advancing by alternate steps without running and without prescribed stride or cadence.

37. Standing: Supporting oneself on the feet and legs in an upright or nearly upright position.

38. Crawling: Moving the body in any direction- while remaining in a prone position- by sliding along, using the hands, elbows, arms, feet, knees, or legs for mobility but not for support.

39. Kneeling: Bending the legs at the knee to come to rest on the knee or knees.

40. Pulling-Straight: Exerting force upon an object so that the object moves toward the force.

41. Pulling-Hand Over Hand: Using both hands alternately, grasping with one hand, releasing, grasping with the other to exert force upon an object so that the object moves toward the force.

42. Pushing: Exerting force upon an object so that the object moves away from the force, including slapping, striking, kicking, and treadle actions.

43. Reaching Above Shoulder: Extending the hands and arms in any direction above shoulder height.

44. Use of Fingers: Picking, pinching or other motions requiring finger dexterity. (Not to be confused with handling).

45. Both Hands Required: Seizing, holding, grasping, turning or otherwise working with both hands.

46. Repeated Bending: Bending the body downward from a standing position by bending the spine at the waist.

47. Climbing, Legs Only: Climbing stairs or other inclines whereby use of hands and arms as well as feet and legs.

48. Climbing, Use of Legs and Arms: Climbing such places or fixtures as ramps, ladders, scaffoldings, poles and ropes by using hands and arms as well as feet and legs.

49. Both Legs Required: Engaging in work in which the use of both legs is required in the performance of duty.

50. Operation of Crane, Truck, Tug, Tractor, or Motor Vehicle: Operating excavating or hauling equipment.

51. Ability for Rapid Mental and Muscular Coordination: Regulating and combing parts of the body in harmonious action with a normal sequence of functions. A co-working of particular groups of muscles for the performance of definite adaptive useful responses employing the motor apparatus of the brain, including reaction time, sureness, deftness.

52. Ability to Use and Desirability of Using Firearms: Performing work in which it is necessary to have obtained proficiency in the use of firearms.

53. Specific Visual Requirements: State visual requirements of the job, such as "ability to read small print", or "ability to make fine adjustments on machine operations".

54. Both Eyes Required: Engaging in work which requires vision in both eyes for the performance of duty.

55. Depth Perception: Perceiving distances of an object from the observer or from one object to another at different distances from the observer.

56. Ability to Distinguish Basic Colors: Identifying basic colors such as red, green, or blue, either from a distance or close at hand as

required by duties of the billet.

57. Ability to Distinguish Shades of Colors: Identifying shades of color such as light red or dark brown from a distance or close at hand as required by duties of the billet.

58. Hearing Requirements (Specify): State hearing requirements of the job, such as "ability to hear the human voice in ordinary conversation", "ability to hear a whisper".

When completed, Naval Job Physical Requirements (Navpers 2499) should be fastened to the appropriate Naval Job Analysis Schedule (Navpers 2497) and Naval Job Questionnaire (Navpers 2496).

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